



February 12, 2009

Mr. Dan McCaskill, CIH  
BNSF Railway Company  
2600 Lou Menk Drive  
Fort Worth, TX 76161

**Re: Steel Gang Air Monitoring  
BNSF OSHA Exposure Sampling Summary Report  
BNSF Kootenai River Subdivision- Mileposts 1312 to 1341  
EPA Operable Unit 6  
September 2008  
EMR Project No. 5539.120**

Dear Mr. McCaskill:

EMR, Inc. (EMR) was contracted by the BNSF Railway Company (BNSF) to conduct Occupational Safety and Health Administration (OSHA) Exposure Sampling on the steel gangs conducting track repair/replacement in the portion of the BNSF right-of-way located in the United States Environmental Protection Agency (EPA)-designated Operable Unit 6 (OU6). OU6 is roughly centered on Libby, Montana (Figure 1). The OSHA Exposure Sampling was conducted simultaneously with an Activity-Based Sampling (ABS) event along the BNSF right-of-way during steel gang track work performed in September 2008.

Though the ABS event was requested by the as part of the EPA Libby Superfund project, the OSHA sampling was conducted on behalf of BNSF industrial hygiene and was not subject to review by EPA or their agent, Camp, Dresser and McKee (CDM), administrators of the Superfund cleanup in Libby. This OSHA Exposure Sampling work was conducted by EMR for BNSF based on potential asbestos (tremolite and related minerals) hazards within track ballast material near the Libby area. The potential hazard consists of the disturbance of previously-deposited asbestos fibers during rail maintenance activities. Asbestos fibers within the track structure are associated with rail transport of W.R. Grace vermiculite ore or processed Zonolite shipped on this line through approximately 1990, the date of the mine closure.

The purpose of the OSHA Exposure Sampling was to gather sufficient, representative data to allow BNSF Industrial Hygiene personnel to ensure that BNSF Maintenance of Way personnel were not being exposed to asbestos concentrations in excess of the Permissible Exposure Level (PEL) and that the Personal Protective Equipment and work practices prescribed by BNSF are sufficient for worker protection.

## Methods

The exposure sampling program utilized Gillian BDX II personal air pumps equipped with Zefon 25mm Phase Contrast Microscopy (PCM) cassettes and 0.8 µm Mixed Cellulose Ester (MCE) filters. These cassettes were utilized for both PCM analysis by NIOSH 7400 and Transmission Electron Microscopy (TEM) analysis by the ISO 10312 method. EMR performed all PCM analysis, while TEM analysis was conducted by EMSL's Libby laboratory.

The ISO 10312 method, which was the TEM method used in this evaluation, determines and counts the types(s) of asbestos structures present, but sometimes cannot discriminate between individual fibers of amphibole and non-asbestos analogues of the same amphibole mineral. The method is defined for polycarbonate capillan/pre filters or cellulose ester (either mixed esters of cellulose or cellulose nitrate) filters through which a known volume of air has been drawn. In addition, the method uses "bins" to count structures of various lengths and widths, from 0.5 microns in length and no minimum width. Six bins counting Libby Amphibole (LA), other amphibole (OA), and chrysotile (C) were utilized as follows:

- Bin A: All LA, OA and C fibers with a less than 5:1 length to width aspect ratio
- Bin B: All LA, OA and C fibers with greater than or equal to 5 aspect ratio and length less than 0.5 microns.
- Bin C: All LA, OA and C fibers with greater than or equal to 5 aspect ratio and width less than or equal to 0.5 microns.
- Bin D: All LA, OA and C fibers with greater than or equal to 5 aspect ratio, length between 0.5 and 5 microns and width less than or equal to 0.5 microns.
- Bin E: All LA, OA and C fibers with greater than or equal to 5 aspect ratio, length between 5 and 10 microns and width less than or equal to 0.5 microns.
- Bin F: All LA, OA and C fibers with greater than or equal to 5 aspect ratio, length greater than 10 microns and width less than or equal to 0.5 microns.

## On Site Personnel

A team of four EMR employees were selected to implement the ABS Sampling and Analysis Plan (SAP). The team consisted of John Starr, Matt Lenz, Amanda Thornton-DeWitt and David Welch. The primary responsibilities of the team were as follows:

John Starr – responsible for conducting personal air monitoring and Phase Contrast Microscopy (PCM) analysis of air samples collected from the BNSF steel gang crews and for delivery of air cassettes to EMSL's Libby laboratory for AHERA TEM analysis and setup and movement of air sampling equipment.

Dave Welch - responsible for overall field operations; conduct daily tailgate safety meetings; responsible for all ABS soil sampling activity and data sheets; review of ABS Air Data Sheets; assisted in getting personal pumps attached to BNSF personnel and setup and movement of air sampling equipment.

Matt Lenz - responsible for overall ABS air monitoring activities and datasheets for EPA review; responsible for setting up and tearing down weather station each work shift, downloading weather data each day from weather station.

Amanda Thornton-DeWitt - responsible for overall field records/field notes for ABS program, assisted in setting up and tearing down weather station each work shift and assisted in ABS datasheet preparation.

Other on-site personnel included Scott Carney, Laura Trozzolo and Nicole Bein. Scott Carney, EMR Project Manager, was on site for the first several days of the project to ensure all operations were initiated according to SAP. Laura Trozzolo, of ENSR/AECOM, the author of the SAP also was on site for several days to ensure EMR's complete understanding and execution of the work plan. Nicole Bein, the CDM representative, was on-site to observe work activities on behalf of EPA.

### **Sampling Overview**

EMR mobilized to Libby, Montana on September 15<sup>th</sup> to perform the ABS and OSHA sampling activities outlined in the SAP, which was submitted to the EPA in September 2008. On September 16<sup>th</sup>, the EMR sampling team attended a CDM training session regarding the Libby-specific sampling techniques. EMR commenced with OSHA and ABS sampling on September 17, 2008. EMR conducted sampling associated with the RP-15 gang between September 17 and September 22 and on September 25. Sampling was conducted with RP-21 on September 23 and 24. Project activities concluded on September 25, 2008. A total of seven (7) days of OSHA exposure sampling were conducted during BNSF steel gang work in the area.

All of BNSF's work using steel gangs RP-15 and RP-21 was related to track replacement and/or repair of mainline or siding tracks along the right-of-way east and west of Libby, Montana within OU6. All of the work required track protection, which was conducted by BNSF steel gang roadmasters or their supervisors using a Form B or "track and time". The RP-15 gang roadmaster was Mr. Rock LaSorte, the RP-21 gang roadmaster was Mr. Chad Gohman. Because the ABS program did not allow water to be used in order to best represent potential trespasser exposure, no water trucks were used to wet the track bed down prior to air sampling. The crews were consistent regarding wearing of tyvek suits for dermal protection during the work activity but the wearing of respiratory protection was sporadic.

The following is a daily summary of OSHA exposure sampling activities from September 17 to September 25, 2008. Attached are site location maps, photolog of work activities (Attachment A), air monitoring data sheets with PCM air monitoring results (Attachment B), and TEM results and chain of custody forms from EMSL laboratory (Attachment B). Figure 1 shows an overview of the BNSF track right-of-way within OU6 that extends west from MP1298 to MP1341. Figure 2 shows the location of September 17, 2008 work at MP 1312. Figure 3 shows the location of the September 18, 19 and 22 work at MP 1331.5, 1331 and 1329.5. Figure 4 shows the location of the September 23, 24 and 25, 2008 work at MP 1337, 1339.5 and 1341.

Table 1 shows a summary of both Phase Contrast Microscopy (PCM) and Transmission Electron Microscopy (TEM) air data results. Criteria that determined which samples were analyzed by TEM included:

- 1) Samples that were visibly overloaded with particulates; and
- 2) Select samples that showed detectable fibers by the PCM method that were greater than air clearance (0.01 fibers/cc) or PEL (0.1 fibers/cc).

Two samples that were collected on the final day of sampling contained fiber concentrations that exceeded 0.01 fibers/cc with sample #53 containing 0.014 fibers/cc and #54 containing 0.013 fibers/cc. It should be noted that these two samples only ran for three hours and pulled air volume of 418 to 425 liters compared to a typical five to eight hour time span (volumes between 700 and 1300 liters). It is suspected that the limited volume of air caused the skewed results, not airborne fiber concentrations. These samples were not analyzed via TEM.

#### **Site Activities-September 17, 2008; RP-15 Gang; MP 1312**

The initial work area was MP 1312, which is east of Libby and approximately 2 ½ miles east of the former Kootenai Bluffs vermiculite ore loading facility (Figure 2).

Following a tailgate safety meeting at 0600, EMR fitted six (6) BNSF workers with pumps and air cassettes. Three (3) of the workers tested were laborers, the other three (3) operated machinery. The six BNSF workers sampled during the day are listed as follows:

Rodney Zimmerman	Tamper Operator	BNSF Employee #7353139
Kagen Cox	Laborer	BNSF Employee #1770973
Josh Synnott	Laborer	BNSF Employee #1773688
Ryan Tucker	Laborer	BNSF Employee #1773621
Bryce Van Den Berg	Scrub Crane Operator	BNSF Employee #4861159
Mike Cossairt	Spiker Operator	BNSF Employee #1616770

One sample was collected for each worker and ran continuously throughout the work shift. The samples were started immediately following the safety meeting and were turned off in the afternoon at shift end. Average flow rate for each of the six samples was 2.4 liters per minute (L/m). The total minutes that each pump operated ranged from 532 to 539 minutes. Total volume drawn through the air cassettes ranged from 1277 to 1294 liters (Attachment B).

The samples were labeled 1 through 8 and consisted of two laboratory blanks followed by the six personal samples (Table 1).

#### **Site Activities-September 18, 2008; RP-15 Gang; MP 1331.5**

This work was conducted at MP 1331.5, between Libby and Troy near West Kootenai Falls (Figure 3).

Following a tailgate safety meeting at 0600, EMR fitted six (6) BNSF workers with pumps and air cassettes. Three (3) of the workers tested were laborers, the other three (3) operated machinery. The six BNSF workers sampled during the day are listed as follows:

Rodney Zimmerman	Tamper Operator	BNSF Employee #7353139
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Kagen Cox	Laborer	BNSF Employee #1770973
Josh Synnott	Laborer	BNSF Employee #1773688
Ryan Tucker	Laborer	BNSF Employee #1773621
Bryce Van Den Berg	Machine Operator	BNSF Employee #4861159
Mike Cossairt	Machine Operator	BNSF Employee #1616770

One sample was collected for each worker and ran continuously throughout the work shift. The samples were started immediately following the safety meeting and were turned off in the afternoon at shift end. Average flow rate for each of the six samples was 2.4 L/m. The total minutes that each pump operated ranged from 483 to 494 minutes. Total volume drawn through the air cassettes ranged from 1159 to 1186 liters (Attachment B).

The samples were labeled 9 through 16 and consisted of two laboratory blanks followed by the six personal samples (Table 1).

#### **Site Activities-September 19, 2008; RP-15 Gang; MP 1331**

This work was conducted at MP 1331, between Libby and Troy, halfway between West Kootenai Falls and East Kootenai Falls (Figure 4).

Following a tailgate safety meeting at 0600, EMR fitted six (6) BNSF workers with pumps and air cassettes. Two (2) of the workers tested were laborers, the other four (4) operated machinery. The six BNSF workers sampled during the day are listed as follows:

Rodney Zimmerman	Tamper Operator	BNSF Employee #7353139
Kagen Cox	Laborer	BNSF Employee #1770973
Josh Synnott	Machine Operator	BNSF Employee #1773688
Ryan Tucker	Laborer	BNSF Employee #1773621
Bryce Van Den Berg	Machine Operator	BNSF Employee #4861159
Mike Cossairt	Machine Operator	BNSF Employee #1616770

One sample was collected for each worker and ran continuously throughout the work shift. The samples were started immediately following the safety meeting and were turned off in the afternoon at shift end. Average flow rate for each of the six samples was 2.4 L/m. The total minutes that each pump operated ranged from 285 to 294 minutes. Total volume drawn through the air cassettes ranged from 684 to 701 liters (Attachment B).

The samples were labeled 17 through 24 and consisted of two laboratory blanks followed by the six personal samples (Table 1).

#### **Site Activities-September 22, 2008; RP-15 Gang; MP 1329.5**

This work was conducted at MP 1329.5, between Libby and Troy, just east of East Kootenai Falls (Figure 5).

Following a tailgate safety meeting at 0600, EMR fitted six (6) BNSF workers with pumps and air cassettes. Four (4) of the workers tested were laborers, the other two (2) operated machinery. The six BNSF workers sampled during the day are listed as follows:

Colbie Christie	Laborer	BNSF Employee #1709021
Mark Eckstrom	Laborer	BNSF Employee #1772359
Josh Synnott	Laborer	BNSF Employee #1773688
Ryan Tucker	Laborer	BNSF Employee #1773621
Bryce Van Den Berg	Machine Operator	BNSF Employee #4861159
Mike Cossairt	Machine Operator	BNSF Employee #1616770

One sample was collected for each worker and ran continuously throughout the work shift. The samples were started in the morning immediately following the safety meeting and were turned off in the afternoon at shift end. Average flow rate for each of the six samples was 2.4 L/m. The total minutes that each pump operated ranged from 403 to 420 minutes. Total volume drawn through the air cassettes ranged from 967 to 1008 liters (Attachment B).

The samples were labeled 25 through 32 and consisted of two laboratory blanks followed by the six personal samples (Table 1).

#### **Site Activities-September 23, 2008; RP-21 Gang; MP 1337**

The RP-21 gang was monitored on September 23 and 24, 2008. The September 23<sup>rd</sup> work was conducted at MP 1337, between East Troy and West Kootenai Falls (Figure 6).

Following a tailgate safety meeting at 0600, EMR fitted six (6) BNSF workers with pumps and air cassettes. Two (2) of the workers tested were laborers, the other four (4) operated machinery. The six BNSF workers sampled during the day are listed as follows:

Jody Crowe	Plate Blocker (Laborer)	BNSF Employee #1741867
Ben Robertson	Laborer	BNSF Employee #1689439
Clint Combs	Machine Operator	BNSF Employee #1741768
C.J. Caven	Spike Puller	BNSF Employee #1740927
Justin Garrett	Pre-Gauger	BNSF Employee #1750256
Karl Harms	Anchor Box Operator	BNSF Employee #1714302

One sample was collected for each worker and ran continuously throughout the work shift. The samples were started immediately following the safety meeting and were turned off in the afternoon at shift end. Average flow rate for five of the six samples was 2.4 L/m. The #40 sample had an average flow rate of 2.8 L/m. The total minutes that each pump operated ranged from 289 to 338 minutes. Total volume drawn through the air cassettes ranged from 694 to 918 liters (Attachment B).

The samples were labeled 33 through 40 and consisted of two laboratory blanks followed by the six personal samples (Table 1).

#### **Site Activities-September 24, 2008; RP-21 Gang; MP 1339.5**

This work was conducted at MP 1339.5, on the west end of the Troy rail yard (Figure 7).

Following a tailgate safety meeting at 0600, EMR fitted six (6) BNSF workers with pumps and air cassettes. Three (3) of the workers tested were laborers or ground personnel, the other three (3) operated machinery. The six BNSF workers sampled during the day are listed as follows:

Jody Crowe	Clip Remover (Laborer)	BNSF Employee #1741867
Ben Robertson	Assistant Foreman	BNSF Employee #1689439
Aurthur McKee	Machine Operator	BNSF Employee # (see note below)
C.J. Caven	Spike Puller	BNSF Employee #1740927
Dale Johnson	Assistant Foreman	BNSF Employee #4405254
Daniel Rodriguez	Machine Operator	BNSF Employee #1768266

*Note: Aurthur McKee, as listed in the project data sheets and field notes was not on either of the RP-15 or RP-21 gangs according to Rock LaSorte and Chad Gohman of BNSF. Though the data for this steel gang worker is recorded, it unknown who this individual actually was. EMR suspects the worker may have given us an alias or fictitious name.*

One sample was collected for each worker and ran continuously throughout the work shift. The samples were started immediately following the safety meeting and were turned off in the afternoon at shift end. Average flow rate for each of the six samples was 2.4 L/m. The total minutes that each pump operated ranged from 402 to 438 minutes. Total volume drawn through the air cassettes ranged from 965 to 1051 liters (Attachment B).

The samples were labeled 41 through 48 and consisted of two laboratory blanks followed by the six personal samples (Table 1).

#### **Site Activities-September 25, 2008; RP-15 Gang; MP 1341**

This work was conducted at MP 1341, at the west end of the OU6 approximately 1 ½ miles west of the Troy rail yard (Figure 8).

Following a tailgate safety meeting at 0600, EMR fitted six (6) BNSF workers with pumps and air cassettes. Four (4) of the workers tested were laborers, the other two (2) operated machinery. The six BNSF workers sampled during the day are listed as follows:

Rodney Zimmerman	Laborer	BNSF Employee #7353139
Kagen Cox	Laborer	BNSF Employee #1770973
Josh Synnott	Laborer	BNSF Employee #1773688
Ryan Tucker	Laborer	BNSF Employee #1773621
Victor Bachmeier	Machine Operator	BNSF Employee #1620103
Mike Cossairt	Machine Operator	BNSF Employee #1616770

One sample was collected for each worker and ran continuously throughout the work shift. The samples were started immediately following the safety meeting and were turned off in the afternoon at shift end. Average flow rate for each of the six samples was 2.4 L/m. The total minutes that each pump operated ranged from 169 to 177 minutes. Total volume drawn through the air cassettes ranged from 406 to 425 liters (Attachment B). The RP-15 crew operated to the west of OU6 after MP 1341 and were not monitored for the rest of their shift.

The samples were labeled 49 through 56 and consisted of two laboratory blanks followed by the six personal samples (Table 1).

## **SAMPLING RESULTS**

### **Analytical Results-September 17, 2008; RP-15 Gang; MP 1312**

Two of the samples, 4 and 5 along with field blanks were tested by PCM. Analysis of samples 4 and 5 resulted in a concentration of 0.003 fibers per cubic centimeter (f/cc), which is less than the OSHA Permissible Exposure Limit (PEL) of 0.1 f/cc. Samples 3, 6, 7 and 8 were occluded and delivered to EMSL's Libby lab for TEM analysis by the ISO 10312 Direct Method. Samples 3, 6, 7 and 8 analyzed by TEM had no detectable asbestos fibers (Table 1) (Attachment C).

### **Analytical Results-September 18, 2008; RP-15 Gang; MP 1331.5**

Two of the samples, 11 and 12 along with field blanks were tested by PCM. Analysis of samples 11 and 12 resulted in a concentration of 0.004 f/cc, which is less than the OSHA PEL of 0.1 f/cc. Samples 13 through 16 were occluded and delivered to EMSL's Libby lab for TEM analysis by the ISO 10312 Direct Method. Samples 13 through 16 analyzed by TEM had no detectable asbestos fibers (Table 1) (Attachment C).

### **Analytical Results-September 19, 2008; RP-15 Gang; MP 1331**

Two of the samples, 19 and 21 along with field blanks were tested by PCM. Analysis of samples 19 and 21 resulted in concentrations of 0.006 f/cc and 0.005 f/cc, respectively. Both of these results were under the OSHA PEL. Samples 20, 22, 23 and 24 were occluded and delivered to EMSL's Libby lab for TEM analysis by the ISO 10312 Direct Method. Samples 20, 22, 23 and 24 analyzed by TEM had no detectable asbestos fibers (Table 1) (Attachment C).

### **Analytical Results-September 22, 2008; RP-15 Gang; MP 1329.5**

Five of the samples (27 through 30 and 32) along with field blanks were tested by PCM. Analysis of samples 27 through 30 and 32 resulted in concentrations ranging from 0.004 f/cc to 0.006 f/cc. These results were under the OSHA PEL. Sample 31 was occluded and delivered to EMSL's Libby lab for TEM analysis by the ISO 10312 Direct Method. Sample 31 had no detectable asbestos fibers by TEM (Table 1) (Attachment C).

### **Analytical Results-September 23, 2008; RP-21 Gang; MP 1337**

Four of the samples, 35 through 38 along with field blanks were tested by PCM. Analysis of samples 35 through 38 resulted in concentrations of 0.005 f/cc to 0.007 f/cc. These results were under the OSHA PEL. Samples 39 and 40 were occluded and delivered to EMSL's Libby lab for TEM analysis by the ISO 10312 Direct Method. Samples 39 and 40 had no detectable asbestos fibers (Table 1) (Attachment C).

### **Analytical Results-September 24, 2008; RP-21 Gang; MP 1339.5**

Four of the samples (43 through 46) along with field blanks, were tested by PCM. Analysis of samples 43 through 46 resulted in concentrations of 0.003 f/cc to 0.004 f/cc. These results were under the OSHA PEL. Samples 47 and 48 were occluded and delivered to EMSL's Libby lab for TEM analysis by the ISO 10312 Direct Method. Both samples (47 and 48) had no detectable asbestos fibers by TEM (Table 1) (Attachment C).

### **Analytical Results-September 25, 2008; RP-15 Gang; MP 1341**


All six of the worker samples (51 through 56) along with field blanks were tested by PCM. Analysis of samples 51 through 56 resulted in concentrations ranging from 0.006 to 0.014 f/cc. These results were under the OSHA PEL. None of the samples required TEM analysis (Table 1).

EMR appreciates this opportunity to be of service. If you have any questions, please call either Scott Carney at (218) 625-2331 or me at (425) 861-4561.

Sincerely,  
**EMR, Inc.,**



David L. Welch, L.G.  
Project Field Manager



Scott Carney, P.G., CHMM  
Project Manager

cc: D. Smith – BNSF  
S. Carney -- EMR

Attach: Figure 1: Overview of Operable Unit 6 (OU6) BNSF Kootenai River Sub Mile Posts 1312-1341  
Figure 2: Sampling Locations, September 17, 2008 MP 1312  
Figure 3: Sampling Locations, September 18, 19 and 22, 2008; MP 1331.5, 1331, and 1329.5  
Figure 4: Sampling Locations, September 23, 24 and 25, 2008; MP 1337, 1339.5 and 1341.

Table 1: Air Data Summary, PCM and TEM Analysis

Attachment A: Photolog  
Attachment B: Asbestos Air Sampling Data Sheets/Chain-of-Custodies  
Attachment C: TEM Analytical Results



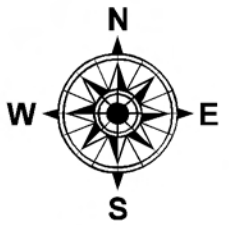
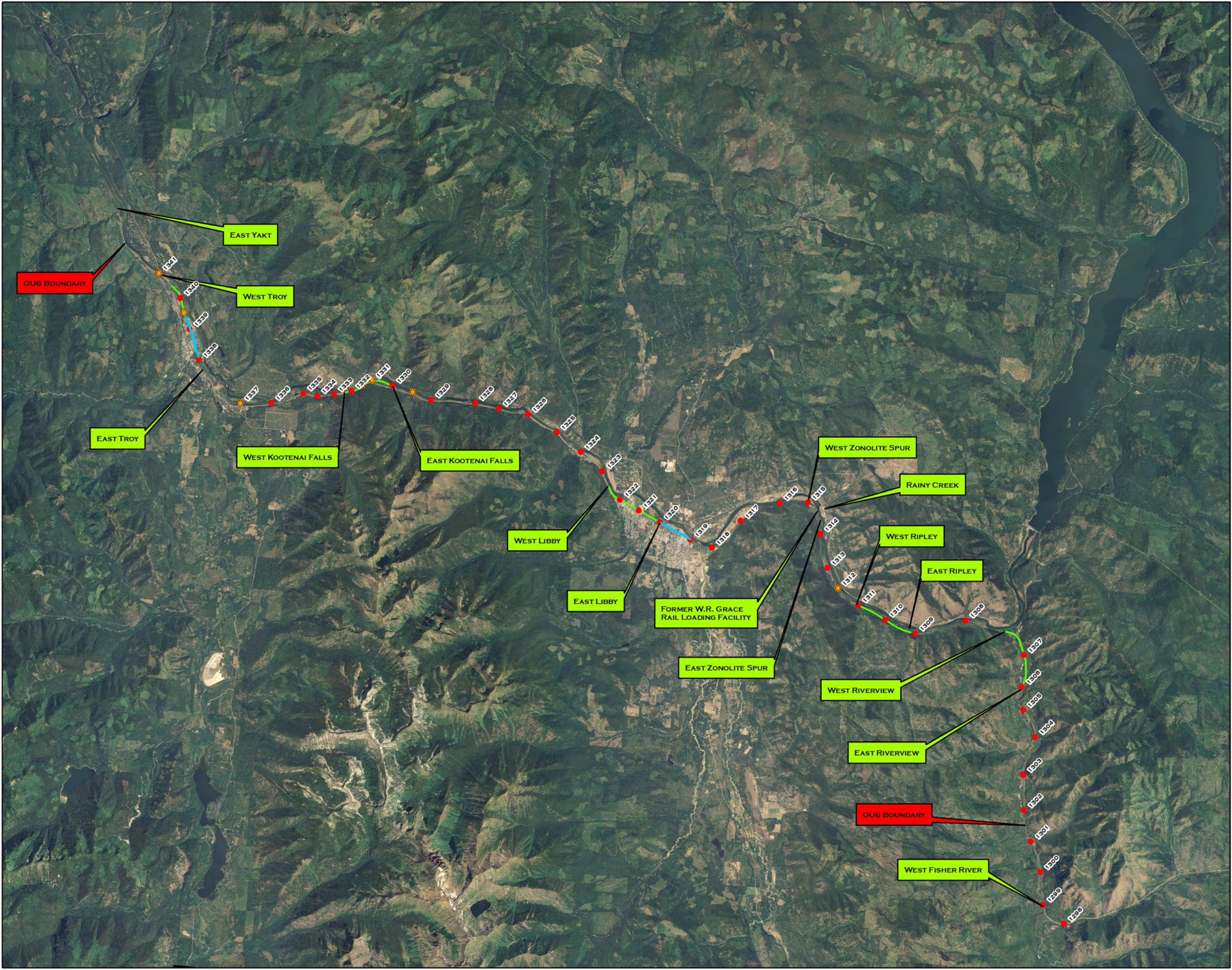


FIGURE 1  
OVERVIEW OF OPERABLE UNIT 6 (OU6)

BNSF KOOTENAI RIVER SUB  
MILE POSTS 1312-1341

BNSF OSHA EXPOSURE  
SAMPLING SUMMARY REPORT

LEGEND

- STEEL GANG WORK SITES
- APPROXIMATE MILEPOST LOCATIONS
- RAIL SIDINGS
- BNSF YARD

0 7,500 15,000 30,000  
SCALE IN FEET

0 1 2 4  
SCALE IN MILES





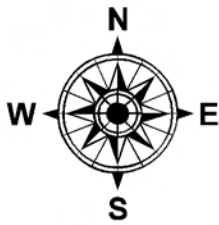


FIGURE 2  
SAMPLING LOCATIONS  
SEPTEMBER 17, 2008

BNSF KOOTENAI RIVER SUB  
MILE POSTS 1312-1341

BNSF OSHA EXPOSURE  
SAMPLING SUMMARY REPORT

LEGEND

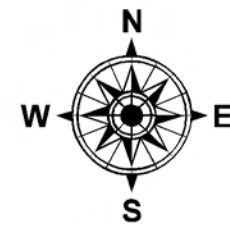
- ★ STEEL GANG WORK SITES
- APPROXIMATE MILEPOST LOCATIONS
- RAIL SIDINGS
- BNSF YARD

0 2,625 5,250 10,500  
SCALE IN FEET

0 0.5 1  
SCALE IN MILES











**FIGURE 3**  
**SAMPLING LOCATIONS**  
**SEPTEMBER 18, 19 & 22, 2008**

**BNSF KOOTENAI RIVER SUB**  
**MILE POSTS 1312-1341**

**BNSF OSHA EXPOSURE**  
**SAMPLING SUMMARY REPORT**

**LEGEND**

-  STEEL GANG WORK SITES
-  APPROXIMATE MILEPOST LOCATIONS
-  RAIL SIDINGS
-  BNSF YARD

0 2,625 5,250 10,500  
SCALE IN FEET

0 0.5 1  
SCALE IN MILES





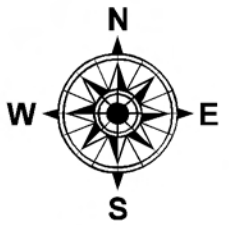
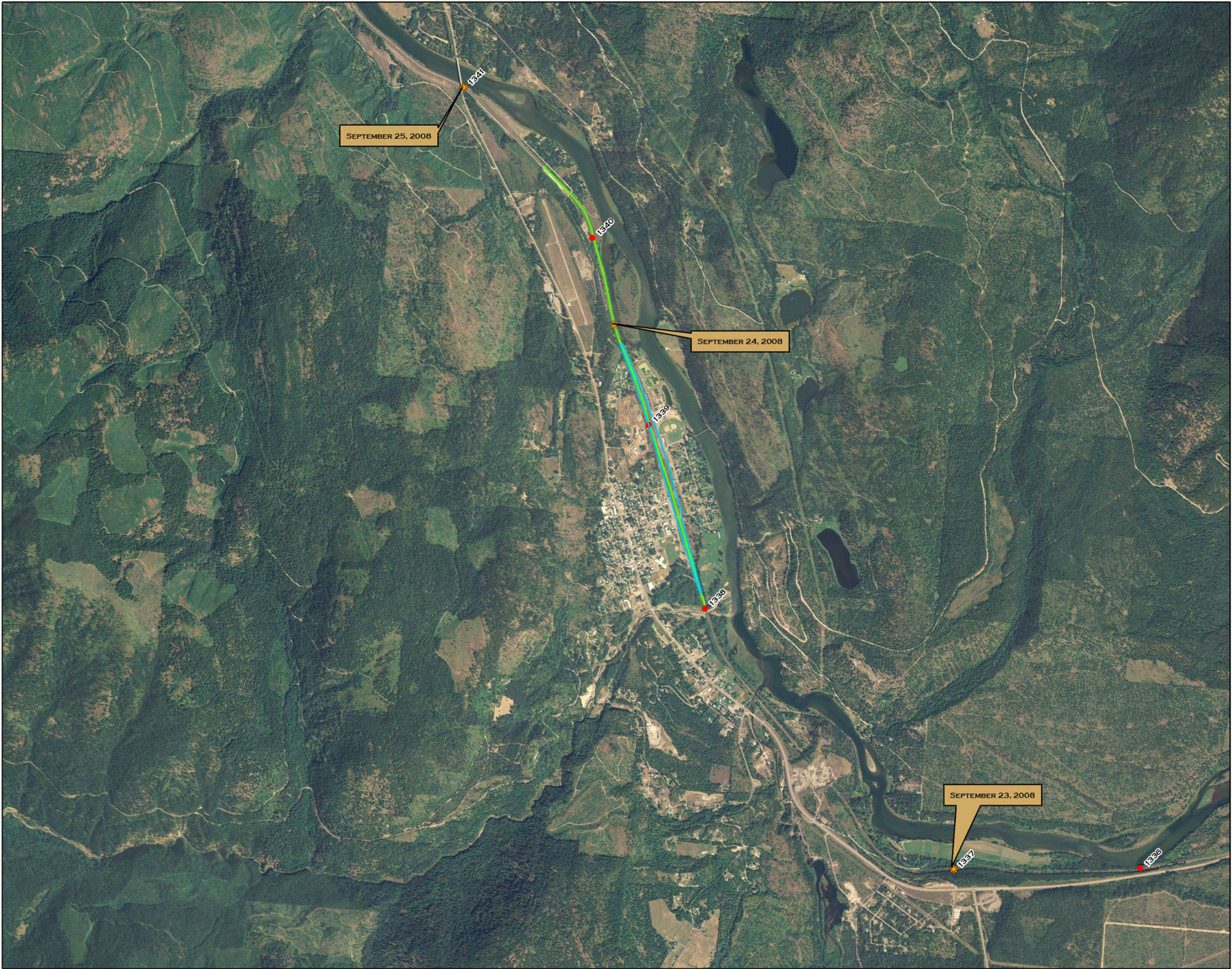


FIGURE 4  
SAMPLING LOCATIONS  
SEPTEMBER 23, 24 & 25, 2008

BNSF KOOTENAI RIVER SUB  
MILE POSTS 1312-1341

BNSF OSHA EXPOSURE  
SAMPLING SUMMARY REPORT

LEGEND

- ★ STEEL GANG WORK SITES
- APPROXIMATE MILEPOST LOCATIONS
- RAIL SIDINGS
- BNSF YARD

0 1,250 2,500 5,000  
SCALE IN FEET

0 0.25 0.5  
SCALE IN MILES





Table 1  
Summary of OSHA Personal Air Monitoring Results  
BNSF RP-15/RP-21  
BNSF Kootenai River Subdivision  
September 17-25, 2008  
EMR Project #5539-110

Normal Preparation

Field Sample ID	Sample Date	Analysis Date	Laboratory	Method	Volume (L)	Sensitivity	LA	OA	C	Fibers/cc	Personnel Name	BNSF Employee #	Task	Milepost
1	9/17/2008	9/17/2008	EMR	NIOSH 7400	-	-	-	-	-	2 <sup>1</sup>	Lab Blank	-	-	1312
2	9/17/2008	9/17/2008	EMR	NIOSH 7400	-	-	-	-	-	2 <sup>1</sup>	Field Blank	-	-	1312
3	9/17/2008	9/30/2008	EMSL	ISO 10312	1435.2	0.00206	<DL	<DL	<DL	-	Rodney Zimmerman	7353139	Tamper Operator	1312
4	9/17/2008	9/17/2008	EMR	NIOSH 7400	1294	-	-	-	-	0.003	Kagen Cox	1770973	Laborer	1312
5	9/17/2008	9/17/2008	EMR	NIOSH 7400	1279	-	-	-	-	0.003	Josh Synnot	1773688	Laborer	1312
6	9/17/2008	9/30/2008	EMSL	ISO 10312	1425.6	0.00208	<DL	<DL	<DL	-	Ryan Tucker	1773621	Laborer	1312
7	9/17/2008	9/30/2008	EMSL	ISO 10312	1425.6	0.00208	<DL	<DL	<DL	-	Bryce Van Den Berg	4861159	Scrub Crane Operator	1312
8	9/17/2008	9/30/2008	EMSL	ISO 10312	1420.8	0.00208	<DL	<DL	<DL	-	Mike Cossairt	1616770	Spiker Operator	1312
9	9/18/2008	9/18/2008	EMR	NIOSH 7400	-	-	-	-	-	2 <sup>1</sup>	Lab Blank	-	-	1331.5
10	9/18/2008	9/18/2008	EMR	NIOSH 7400	-	-	-	-	-	3 <sup>1</sup>	Field Blank	-	-	1331.5
11	9/18/2008	9/18/2008	EMR	NIOSH 7400	1186	-	-	-	-	0.004	Ryan Tucker	1773621	Laborer	1331.5
12	9/18/2008	9/18/2008	EMR	NIOSH 7400	1174	-	-	-	-	0.004	Josh Synnot	1773688	Laborer	1331.5
13	9/18/2008	9/30/2008	EMSL	ISO 10312	1178	0.00224	<DL	<DL	<DL	-	Bryce Van Den Berg	4861159	Machine Operator	1331.5
14	9/18/2008	9/30/2008	EMSL	ISO 10312	1176	0.0024	<DL	<DL	<DL	-	Mike Cossairt	1616770	Machine Operator	1331.5
15	9/18/2008	9/30/2008	EMSL	ISO 10312	1159	0.00224	<DL	<DL	<DL	-	Kagen Cox	1770973	Laborer	1331.5
16	9/18/2008	9/30/2008	EMSL	ISO 10312	1174	0.00221	<DL	<DL	<DL	-	Rodney Zimmerman	7353139	Tamper Operator	1331.5
17	9/19/2008	9/19/2008	EMR	NIOSH 7400	-	-	-	-	-	3 <sup>1</sup>	Lab Blank	-	-	1331
18	9/19/2008	9/19/2008	EMR	NIOSH 7400	-	-	-	-	-	2 <sup>1</sup>	Field Blank	-	-	1331
19	9/19/2008	9/19/2008	EMR	NIOSH 7400	701	-	-	-	-	0.006	Rodney Zimmerman	7353139	Tamper Operator	1331
20	9/19/2008	9/30/2008	EMSL	ISO 10312	698.4	0.00223	<DL	<DL	<DL	-	Josh Synnot	1773688	Machine Operator	1331
21	9/19/2008	9/19/2008	EMR	NIOSH 7400	684	-	-	-	-	0.005	Ryan Tucker	1773621	Laborer	1331
22	9/19/2008	9/30/2008	EMSL	ISO 10312	691.2	0.00226	<DL	<DL	<DL	-	Mike Cossairt	1616770	Machine Operator	1331
23	9/19/2008	9/30/2008	EMSL	ISO 10312	698.4	0.00223	<DL	<DL	<DL	-	Bryce Van Den Berg	4861159	Machine Operator	1331
24	9/19/2008	9/30/2008	EMSL	ISO 10312	705.6	0.0021	<DL	<DL	<DL	-	Kagen Cox	1770973	Laborer	1331
25	9/22/2008	9/22/2008	EMR	NIOSH 7400	-	-	-	-	-	3 <sup>1</sup>	Lab Blank	-	-	1329.5
26	9/22/2008	9/22/2008	EMR	NIOSH 7400	-	-	-	-	-	2 <sup>1</sup>	Field Blank	-	-	1329.5
27	9/22/2008	9/22/2008	EMR	NIOSH 7400	1008	-	-	-	-	0.004	Ryan Tucker	1773621	Laborer	1329.5
28	9/22/2008	9/22/2008	EMR	NIOSH 7400	1003	-	-	-	-	0.005	Mark Eckstrom	1772359	Laborer	1329.5
29	9/22/2008	9/22/2008	EMR	NIOSH 7400	986	-	-	-	-	0.004	Colbey Christie	1709021	Laborer	1329.5
30	9/22/2008	9/22/2008	EMR	NIOSH 7400	986	-	-	-	-	0.006	Josh Synnot	1773688	Laborer	1329.5
31	9/22/2008	9/30/2008	EMSL	ISO 10312	974.4	0.00203	<DL	<DL	<DL	-	Bryce Van Den Berg	4861159	Machine Operator	1329.5
32	9/22/2008	9/22/2008	EMR	NIOSH 7400	967	-	-	-	-	0.005	Mike Cossairt	1616770	Machine Operator	1329.5
33	9/23/2008	9/23/2008	EMR	NIOSH 7400	-	-	-	-	-	2 <sup>1</sup>	Lab Blank	-	-	1337
34	9/23/2008	9/23/2008	EMR	NIOSH 7400	-	-	-	-	-	2 <sup>1</sup>	Field Blank	-	-	1337
35	9/23/2008	9/23/2008	EMR	NIOSH 7400	694	-	-	-	-	0.006	Jody Crowe	1741867	Plate Blocker	1337
36	9/23/2008	9/23/2008	EMR	NIOSH 7400	811	-	-	-	-	0.007	Ben Robertson	1689439	Laborer	1337

Table 1  
Summary of OSHA Personal Air Monitoring Results  
BNSF RP-15/RP-21  
BNSF Kootenai River Subdivision  
September 17-25, 2008  
EMR Project #5539-110

Field Sample ID	Sample Date	Analysis Date	Laboratory	Method	Volume (L)	Sensitivity	LA	OA	C	Fibers/cc	Personnel Name	BNSF Employee #	Task	Milepost
37	9/23/2008	9/23/2008	EMR	NIOSH 7400	792	-	-	-	-	0.007	Clint Combs	1741768	Machine Operator	1337
38	9/23/2008	9/23/2008	EMR	NIOSH 7400	778	-	-	-	-	0.005	CJ Caven	1740927	Spike Puller	1337
39	9/23/2008	10/28/2008	EMSL	ISO 10312	792	OVERLOADED FILTER (SEE BELOW)				-	Justin Garrett	1750256	Pre-Gauger	1337
40	9/23/2008	10/28/2008	EMSL	ISO 10312	918	OVERLOADED FILTER (SEE BELOW)				-	Karl Harms	1714302	Anchor Box Operator	1337
41	9/24/2008	9/24/2008	EMR	NIOSH 7400	-	-	-	-	-	2 <sup>1</sup>	Lab Blank	-	-	1339.5
42	9/24/2008	9/24/2008	EMR	NIOSH 7400	-	-	-	-	-	3 <sup>1</sup>	Field Blank	-	-	1339.5
43	9/24/2008	9/24/2008	EMR	NIOSH 7400	977	-	-	-	-	0.004	Dale Johnson	4405254	Asst. Foreman	1339.5
44	9/24/2008	9/24/2008	EMR	NIOSH 7400	986	-	-	-	-	0.004	Jody Crowe	1741867	Clip Remover	1339.5
45	9/24/2008	9/24/2008	EMR	NIOSH 7400	974	-	-	-	-	0.004	CJ Caven	1740927	Laborer	1339.5
46	9/24/2008	9/24/2008	EMR	NIOSH 7400	1051	-	-	-	-	0.003	Ben Robertson	1689439	Asst. Foreman	1339.5
47	9/24/2008	10/28/2008	EMSL	ISO 10312	964	OVERLOADED FILTER (SEE BELOW)				-	Aurthur McKee	(See Note)	Machine Operator	1339.5
48	9/24/2008	10/28/2008	EMSL	ISO 10312	967	0.00236	<DL	<DL	<DL	-	Daniel Rodriguez	1768266	Machine Operator	1339.5
49	9/25/2008	9/25/2008	EMR	NIOSH 7400	-	-	-	-	-	2 <sup>1</sup>	Lab Blank	-	-	1341
50	9/25/2008	9/25/2008	EMR	NIOSH 7400	-	-	-	-	-	2 <sup>1</sup>	Field Blank	-	-	1341
51	9/25/2008	9/25/2008	EMR	NIOSH 7400	422	-	-	-	-	0.006	Josh Synnot	1773688	Laborer	1341
52	9/25/2008	9/25/2008	EMR	NIOSH 7400	422	-	-	-	-	0.009	Ryan Tucker	1773621	Laborer	1341
53	9/25/2008	9/25/2008	EMR	NIOSH 7400	425	-	-	-	-	0.014 <sup>2</sup>	Mike Cossairt	1616770	Machine Operator	1341
54	9/25/2008	9/25/2008	EMR	NIOSH 7400	418	-	-	-	-	0.013 <sup>2</sup>	Victor Backmeier	1620103	Machine Operator	1341
55	9/25/2008	9/25/2008	EMR	NIOSH 7400	410	-	-	-	-	0.07	Rodney Zimmerman	7353139	Laborer	1341
56	9/25/2008	9/25/2008	EMR	NIOSH 7400	406	-	-	-	-	0.008	Kagen Cox	1770973	Laborer	1341

Overloaded Prep

Field Sample ID	Sample Date	Analysis Date	Laboratory	Method/Prep Method	Sensitivity	Bin A Conc (f/cc)	Bin B Conc (f/cc)	Bin C Conc (f/cc)	Bin D Conc (f/cc)	Bin E Conc (f/cc)	Bin F Conc (f/cc)	Personnel Name	Milepost
39	9/23/2008	10/28/2008	EMSL	ISO 10312/Indirect Ashed	0.00359	<DL	<DL	<DL	<DL	<DL	<DL	Justin Garrett	1337
40	9/23/2008	10/28/2008	EMSL	ISO 10312/Indirect Ashed	0.0103	<DL	<DL	<DL	<DL	<DL	<DL	Karl Harms	1337
47	9/24/2008	10/28/2008	EMSL	ISO 10312/Indirect Ashed	0.00589	<DL	<DL	<DL	<DL	<DL	<DL	Aurthur McKee	1399.5

DL - Detection Limits

<sup>1</sup> - # of fibers per 100 fields counted

Aurthur McKee's BNSF employee number unknown; both Rock LaSorte and Chad Gohman stated that this name was not on either of the RP-15 or RP-21 gang lists.

<sup>2</sup> - Results are suspected as skewed based on limited volume of air passing through cassette filters.

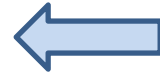
LA - Libby Amphibole

OA - Other Amphibole

C - Chrysotile

**ATTACHMENT A**  
**PHOTOLOG**

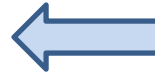




BNSF Gang (RP-21)  
In Troy Yard  
MP 1339.5



BNSF Gang (RP-15)  
working at  
MP 1312



BNSF Gang  
(RP-15)  
working at  
MP 1312



BNSF Gang  
(RP-15)  
working at  
MP 1312







BNSF Gang  
(RP-15)  
In Troy Yard  
MP 1312



BNSF Gang  
(RP-15)  
working at  
MP 1331.5



BNSF Gang  
(RP-15)  
working at  
MP 1312



BNSF Gang  
(RP-15)  
working at  
MP 1331.5



**ATTACHMENT B**  
**AIR DATA SHEETS/CHAIN-OF-CUSTODIES**



# ASBESTOS AIR SAMPLING DATA SHEET

ENCLOSURE \_\_\_\_\_  
 MINI-ENCLOSE \_\_\_\_\_  
 NO ENCLOSURE X \_\_\_\_\_  
 GLOVEBAG \_\_\_\_\_

PASS  
 OR  
 FAIL

BLANK AVERAGE (FIBERS/100 FIELDS) 2.0  
 CLEARANCE SAMPLES \_\_\_\_\_  
 CLEARANCE LEVEL <0.01



PROJECT NO. 5539.110  
 PROJECT TITLE: OSHA Air sampling  
 CLIENT: BNSF - Libby, MT

DATE: 9/17/2008  
 PROJECT MONITOR: John Starr  
 WORK AREA: Mile marker 1312

Sample Number	Pump Number	Time On	Time Off	Total Minutes	Flow Rate (l/m - avg.)	Volume (liters)	Sample Location/Description	Fibers (-blank)	Flds	Fibers/cc	8 Hr. TWA Fibers/cc	
1	-	-	-	-	-	-	Lab Blank	2.0	100	-	-	
2	-	-	-	-	-	-	Field Blank	2.0	100	-	-	
3	HV1	6:37	15:35	538	2.4	1291	RP 15 OSHA R. Zimmerman			Occluded		
4	HV2	6:39	15:38	539	2.4	1294	RP 15 OSHA K. Cox	8.0	100	0.003	0.00	
5	HV3	6:41	15:34	533	2.4	1279	RP 15 OSHA J. Synnott	9.0	100	0.003	0.00	
6	HV4	6:42	15:36	534	2.4	1282	RP 15 OSHA R. Tucker			Occluded		
7	HV5	6:44	15:38	534	2.4	1282	RP 15 OSHA B. Van Den Berg			Occluded		
8	HV6	6:45	15:37	532	2.4	1277	RP 15 OSHA M. Cosscurt			Occluded		
Samples Collected By (Name/Signature): John Starr					Date: 9/17/2008		Received by (Name/Signature):			Date:		
Received by (Name/Signature):					Date:		(Laboratory) Analyzed by (Name/Signature): John Starr			Date: 9/17/2008		
Turnaround Time (X) On-site ( ) Immediate ( ) 24 Hour ( ) Normal							Comments: OSHA sampling on RR workers on track work.					
Laboratory Receiving Notes:		Custody Seal Intact?		Sample Condition:								

OWA = Outside Work Area Enclosure

IWA = Inside Work Area Enclosure

ENCLOSURE \_\_\_\_\_  
 MINI-ENCLOSE \_\_\_\_\_  
 NO ENCLOSURE X \_\_\_\_\_  
 GLOVEBAG \_\_\_\_\_

PASS  
 OR  
 FAIL

# ASBESTOS AIR SAMPLING DATA SHEET

BLANK AVERAGE (FIBERS/100 FIELDS) 2.5  
 CLEARANCE SAMPLES \_\_\_\_\_  
 CLEARANCE LEVEL <0.01

PROJECT NO. 5539.110  
 PROJECT TITLE: OSHA Air sampling  
 CLIENT: BNSF - Libby, MT



DATE: 9/18/2008  
 PROJECT MONITOR: John Starr  
 WORK AREA: Mile Marker 1331.5

Sample Number	Pump Number	Time On	Time Off	Total Minutes	Flow Rate (l/m - avg.)	Volume (liters)	Sample Location/Description	Fibers (-blank)	Flds	Fibers/cc	8 Hr. TWA Fibers/cc	
9	-	-	-	-	-	-	Lab Blank	2.0	100	-	-	
10	-	-	-	-	-	-	Field Blank	3.0	100	-	-	
11	HV1	6:42	14:56	494	2.4	1186	RP 15 OSHA R. Tucker	8.5	100	0.004	0.00	
12	HV2	6:44	14:53	489	2.4	1174	RP 15 OSHA J. Synnott	10.5	100	0.004	0.00	
13	HV3	6:46	14:57	491	2.4	1178	RP 15 OSHA B. Van Den Berg			Occluded		
14	HV4	6:48	14:58	490	2.4	1176	RP 15 OSHA M. Cosscurt			Occluded		
15	HV5	6:50	14:53	483	2.4	1159	RP 15 OSHA K. Cox			Occluded		
16	HV6	6:52	15:01	489	2.4	1174	RP 15 OSHA R. Zimmerman			Occluded		
Samples Collected By (Name/Signature): John Starr					Date: 9/18/2008		Received by (Name/Signature):			Date:		
Received by (Name/Signature):					Date:		(Laboratory) Analyzed by (Name/Signature): John Starr			Date: 9/18/2008		
Turnaround Time (X) On-site ( ) Immediate ( ) 24 Hour ( ) Normal							Comments: OSHA sampling on RR workers on track work.					
Laboratory Receiving Notes:		Custody Seal Intact?		Sample Condition:								

OWA = Outside Work Area Enclosure

IWA = Inside Work Area Enclosure



ENCLOSURE \_\_\_\_\_  
 MINI-ENCLOSE \_\_\_\_\_  
 NO ENCLOSURE   X    
 GLOVEBAG \_\_\_\_\_

PASS

OR  
 FAIL

# ASBESTOS AIR SAMPLING DATA SHEET

BLANK AVERAGE (FIBERS/100 FIELDS) 2.5

CLEARANCE SAMPLES \_\_\_\_\_

CLEARANCE LEVEL <0.01

PROJECT NO. 5539.110  
 PROJECT TITLE: OSHA Air sampling  
 CLIENT: BNSF - Libby, MT



DATE: 9/19/2008  
 PROJECT MONITOR: John Starr  
 WORK AREA: Mile Marker 1331

Sample Number	Pump Number	Time On	Time Off	Total Minutes	Flow Rate (l/m - avg.)	Volume (liters)	Sample Location/Description	Fibers (-blank)	Flds	Fibers/cc	8 Hr. TWA Fibers/cc	
17	-	-	-	-	-	-	Lab Blank	3.0	100	-	-	
18	-	-	-	-	-	-	Field Blank	2.0	100	-	-	
19	HV1	6:31	11:23	292	2.4	701	RP 15 OSHA R. Zimmerman	8.5	100	0.006	0.00	
20	HV2	6:33	11:24	291	2.4	698	RP 15 OSHA J. Synnott			Occluded		
21	HV3	6:35	11:20	285	2.4	684	RP 15 OSHA R. Tucker	6.5	100	0.005	0.00	
22	HV4	6:37	11:25	288	2.4	691	RP 15 OSHA M. Cosscurt			Occluded		
23	HV5	6:39	11:30	291	2.4	698	RP 15 OSHA B. Van Den Burg			Occluded		
24	HV6	6:41	11:35	294	2.4	706	RP 15 OSHA K. Cox			Occluded		
Samples Collected By (Name/Signature): John Starr				Date: 9/19/2008		Received by (Name/Signature):				Date:		
Received by (Name/Signature):				Date:		(Laboratory) Analyzed by (Name/Signature): John Starr				Date: 9/19/2008		
Turnaround Time (X) On-site ( ) Immediate ( ) 24 Hour ( ) Normal							Comments: OSHA sampling on RR workers on track work.					
Laboratory Receiving Notes:		Custody Seal Intact?		Sample Condition:								

OWA = Outside Work Area Enclosure

IWA = Inside Work Area Enclosure



# ASBESTOS AIR SAMPLING DATA SHEET

ENCLOSURE \_\_\_\_\_  
 MINI-ENCLOSE \_\_\_\_\_  
 NO ENCLOSURE   X    
 GLOVEBAG \_\_\_\_\_



PASS  
 OR  
 FAIL

BLANK AVERAGE (FIBERS/100 FIELDS) 2.5  
 CLEARANCE SAMPLES \_\_\_\_\_  
 CLEARANCE LEVEL <0.01

PROJECT NO. 5539.110  
 PROJECT TITLE: OSHA Air sampling  
 CLIENT: BNSF - Libby, MT



DATE: 9/22/2008  
 PROJECT MONITOR: John Starr  
 WORK AREA: Mile Marker 1329.5

Sample Number	Pump Number	Time On	Time Off	Total Minutes	Flow Rate (l/m - avg.)	Volume (liters)	Sample Location/Description	Fibers (-blank)	Flds	Fibers/cc	8 Hr. TWA Fibers/cc	
25	-	-	-	-	-	-	Lab Blank	3.0	100	-	-	
26	-	-	-	-	-	-	Field Blank	2.0	100	-	-	
27	HV1	6:21	13:21	420	2.4	1008	RP 15 OSHA R. Tucker	7.5	100	<b>0.004</b>	0.00	
28	HV2	6:24	13:22	418	2.4	1003	RP 15 OSHA M. Eckstrom	9.5	100	<b>0.005</b>	0.00	
29	HV3	6:26	13:17	411	2.4	986	RP 15 OSHA C. Christie	8.5	100	<b>0.004</b>	0.00	
30	HV4	6:29	13:20	411	2.4	986	RP 15 OSHA J. Synnott	11.5	100	<b>0.006</b>	0.00	
31	HV5	6:33	13:19	406	2.4	974	RP 15 OSHA B. Van Den Burg			<b>Occluded</b>		
32	HV6	6:36	13:19	403	2.4	967	RP 15 OSHA M. Cosscurt	9.5	100	<b>0.005</b>	0.00	
Samples Collected By (Name/Signature): John Starr 				Date: 9/22/2008		Received by (Name/Signature):				Date:		
Received by (Name/Signature):				Date:		(Laboratory) Analyzed by (Name/Signature): John Starr 				Date: 9/22/2008		
Turnaround Time (X) On-site ( ) Immediate ( ) 24 Hour ( ) Normal							Comments: OSHA sampling on RR workers on track work.					
Laboratory Receiving Notes:		Custody Seal Intact?		Sample Condition:								

OWA = Outside Work Area Enclosure

IWA = Inside Work Area Enclosure

# ASBESTOS AIR SAMPLING DATA SHEET

ENCLOSURE \_\_\_\_\_  
 MINI-ENCLOSE \_\_\_\_\_  
 NO ENCLOSURE   *✓*    
 GLOVEBAG \_\_\_\_\_

PASS  
 OR  
 FAIL

BLANK AVERAGE (FIBERS/100 FIELDS) 2.0  
 CLEARANCE SAMPLES \_\_\_\_\_  
 CLEARANCE LEVEL <0.01

PROJECT NO. 5539.110  
 PROJECT TITLE: OSHA Air sampling  
 CLIENT: BNSF - Libby, MT



DATE: 9/23/2008  
 PROJECT MONITOR: John Starr  
 WORK AREA: Mile Marker 1337

Sample Number	Pump Number	Time On	Time Off	Total Minutes	Flow Rate (l/m - avg.)	Volume (liters)	Sample Location/Description	Fibers (-blank)	Flds	Fibers/cc	8 Hr. TWA Fibers/cc
33	-	-	-	-	-	-	Lab Blank	2.0	100	-	-
34	-	-	-	-	-	-	Field Blank	2.0	100	-	-
35	HV1	6:31	11:20	289	2.4	694	RP 21 OSHA J. Crowe	8.0	100	<b>0.006</b>	0.00
36	HV2	6:32	12:10	338	2.4	811	RP 21 OSHA B. Robertson	11.0	100	<b>0.007</b>	0.00
37	HV3	6:35	12:05	330	2.4	792	RP 21 OSHA C. Combs	12.0	100	<b>0.007</b>	0.01
38	HV4	6:36	12:00	324	2.4	778	RP 21 OSHA C. Caven	8.0	100	<b>0.005</b>	0.00
39	HV5	6:38	12:08	330	2.4	792	RP 21 OSHA J. Garrett			<b>Occluded</b>	
40	HV6	6:40	12:08	328	2.8	918	RP 21 OSHA K. Harms			<b>Occluded</b>	
Samples Collected By (Name/Signature): John Starr <i>[Signature]</i>				Date: 9/23/2008		Received by (Name/Signature):  Date:					
Received by (Name/Signature):  				Date:  		(Laboratory) Analyzed by (Name/Signature): John Starr <i>[Signature]</i> Date: 9/23/2008					
Turnaround Time (X) On-site ( ) Immediate ( ) 24 Hour ( ) Normal							Comments: OSHA sampling on RR workers on track work.				
Laboratory Receiving Notes:		Custody Seal Intact?		Sample Condition:							

OWA = Outside Work Area Enclosure

IWA = Inside Work Area Enclosure



# ASBESTOS AIR SAMPLING DATA SHEET

ENCLOSURE \_\_\_\_\_  
 MINI-ENCLOSE \_\_\_\_\_  
 NO ENCLOSURE ✓  
 GLOVEBAG \_\_\_\_\_

PASS  
 OR  
 FAIL

BLANK AVERAGE (FIBERS/100 FIELDS) 2.5  
 CLEARANCE SAMPLES \_\_\_\_\_  
 CLEARANCE LEVEL <0.01

PROJECT NO. 5539.110  
 PROJECT TITLE: OSHA Air sampling  
 CLIENT: BNSF - Libby, MT



DATE: 9/24/2008  
 PROJECT MONITOR: John Starr  
 WORK AREA: Mile Marker 1339.5

Sample Number	Pump Number	Time On	Time Off	Total Minutes	Flow Rate (l/m - avg.)	Volume (liters)	Sample Location/Description	Fibers (-blank)	Flds	Fibers/cc	8 Hr. TWA Fibers/cc
41	-	-	-	-	-	-	Lab Blank	2.0	100	-	-
42	-	-	-	-	-	-	Field Blank	3.0	100	-	-
43	HV1	6:22	13:09	407	2.4	977	RP 21 OSHA D. Johnson	8.5	100	<b>0.004</b>	0.00
44	HV2	6:24	13:15	411	2.4	986	RP 21 OSHA J. Crowe	7.5	100	<b>0.004</b>	0.00
45	HV3	6:25	13:11	406	2.4	974	RP 21 OSHA C. Caven	7.5	100	<b>0.004</b>	0.00
46	HV4	6:27	13:45	438	2.4	1051	RP 21 OSHA B. Robertson	6.5	100	<b>0.003</b>	0.00
47	HV5	6:29	13:12	403	2.4	967	RP 21 OSHA A. McKee			<b>Occluded</b>	
48	HV6	6:31	13:13	402	2.4	965	RP 21 OSHA D. Rodriguez			<b>Occluded</b>	
Samples Collected By (Name/Signature): John Starr					Date: 9/24/2008		Received by (Name/Signature):			Date:	
Received by (Name/Signature):					Date:		(Laboratory) Analyzed by (Name/Signature): John Starr			Date: 9/24/2008	
Turnaround Time (X) On-site ( ) Immediate ( ) 24 Hour ( ) Normal							Comments: OSHA sampling on RR workers on track work.				
Laboratory Receiving Notes:		Custody Seal Intact?		Sample Condition:							

OWA = Outside Work Area Enclosure

IWA = Inside Work Area Enclosure

ENCLOSURE \_\_\_\_\_  
 MINI-ENCLOSE \_\_\_\_\_  
 NO ENCLOSURE \_\_\_\_\_  
 GLOVEBAG \_\_\_\_\_

PASS  
 OR  
 FAIL

# ASBESTOS AIR SAMPLING DATA SHEET

BLANK AVERAGE (FIBERS/100 FIELDS) 2.0  
 CLEARANCE SAMPLES \_\_\_\_\_  
 CLEARANCE LEVEL <0.01

PROJECT NO. 5539.110  
 PROJECT TITLE: OSHA Air sampling  
 CLIENT: BNSF - Libby, MT



DATE: 9/25/2008  
 PROJECT MONITOR: John Starr  
 WORK AREA: Mile Marker 1341

Sample Number	Pump Number	Time On	Time Off	Total Minutes	Flow Rate (l/m - avg.)	Volume (liters)	Sample Location/Description	Fibers (-blank)	Flds	Fibers/cc	8 Hr. TWA Fibers/cc	
49	-	-	-	-	-	-	Lab Blank	2.0	100	-	-	
50	-	-	-	-	-	-	Field Blank	2.0	100	-	-	
51	HV1	6:24	9:20	176	2.4	422	RP 15 OSHA J. Synnott	5.0	100	0.006	0.00	
52	HV2	6:25	9:21	176	2.4	422	RP 15 OSHA R. Tucker	8.0	100	0.009	0.00	
53	HV3	6:27	9:24	177	2.4	425	RP 15 OSHA M. Cosscurt	12.0	100	0.014	0.01	
54	HV4	6:29	9:23	174	2.4	418	RP 15 OSHA V. Bachmeier	11.0	100	0.013	0.00	
55	HV5	6:31	9:22	171	2.4	410	RP 15 OSHA R. Zimmerman	6.0	100	0.007	0.00	
56	HV6	6:33	9:22	169	2.4	406	RP 15 OSHA K. Cox	7.0	100	0.008	0.00	
Samples Collected By (Name/Signature): John Starr					Date: 9/25/2008		Received by (Name/Signature):			Date:		
Received by (Name/Signature):					Date:		(Laboratory) Analyzed by (Name/Signature): John Starr			Date: 9/25/2008		
Turnaround Time (X) On-site ( ) Immediate ( ) 24 Hour ( ) Normal							Comments: OSHA sampling on RR workers on track work.					
Laboratory Receiving Notes:		Custody Seal Intact?		Sample Condition:								

OWA = Outside Work Area Enclosure

IWA = Inside Work Area Enclosure





EMSL Analytical, Inc.

Asbestos

## CHAIN OF CUSTODY

Revised January 1, 2000

EMSL Rep:

Your Company Name:

EMSL Analytical, Inc.

Street:

107 4<sup>th</sup> Street West

Box #:

City/State:

Libby, MT

Zip:

59923

Bill to:

Street:

City/State:

EMR, Inc

Scott Carney

Duluth, mn.

Zip:

Phone Results to: Name:

Fax Results to: Name:

Telephone #:

Fax #:

Project Name/Number:

Purchase Order #:

## MATRIX

## TURNAROUND

<input checked="" type="checkbox"/> Air	<input type="checkbox"/> Soil	<input type="checkbox"/> Micro-Vac	<input type="checkbox"/> 3 hrs	<input type="checkbox"/> 6 Hours	<input type="checkbox"/> Same Day or 12 Hours*	<input type="checkbox"/> 24 Hours (1 day)
<input type="checkbox"/> Bulk	<input type="checkbox"/> Drinking Water	<input type="checkbox"/> 48 Hours (2 days)	<input type="checkbox"/> 72 Hours (3 days)	<input type="checkbox"/> 96 Hours (4 days)	<input checked="" type="checkbox"/> 120 Hours (5 Days)	
<input type="checkbox"/> Wipe	<input type="checkbox"/> Wastewater	<input type="checkbox"/> 144+ hours (6-10 Days)				

TEM AIR, 3 hours, 6 hours, Please call ahead to schedule. There is a premium charge for 3-hour tat; please call 1-800-220-3675 for price prior to sending samples. You will be asked to sign an authorization form for this service.

\*12 hours (must arrive by 11:00 a.m Mon - Fri.), Please Refer to Price Quote

<b>PCM - Air</b> <input type="checkbox"/> NIOSH 7400(A) Issue 2: August 1994 <input type="checkbox"/> OSHA w/ TWA <input type="checkbox"/> Other:	<b>TEM Air</b> <input type="checkbox"/> AHERA 40 CFR, Part 763 Subpart E <input type="checkbox"/> NIOSH 7402 Issue 2 <input type="checkbox"/> EPA Level II <input checked="" type="checkbox"/> ISO 10312	<b>TEM Water</b> <input type="checkbox"/> EPA 100.1 <input type="checkbox"/> EPA 100.2 <input type="checkbox"/> NYS 198.2
<b>PLM - Bulk</b> <input type="checkbox"/> EPA 600/R-93/116 <input type="checkbox"/> EPA Point Count <input type="checkbox"/> NYS Stratified Point Count <input type="checkbox"/> PLM NOB (Gravimetric) NYS 198.1 <input type="checkbox"/> NIOSH 9002 <input type="checkbox"/> EMSL Standard Addition	<b>TEM Bulk</b> <input type="checkbox"/> Drop Mount (Qualitative) <input type="checkbox"/> Chatfield SOP - 1988-02 <input type="checkbox"/> TEM NOB (Gravimetric) NYS 198.4 <input type="checkbox"/> EMSL Standard Addition	<b>TEM Microvac/Wipe</b> <input type="checkbox"/> ASTM D 5755-95 quantitative <input type="checkbox"/> Wipe Qualitative
<b>SEM Air or Bulk</b> <input type="checkbox"/> Qualitative <input type="checkbox"/> Quantitative	<b>PLM Soil</b> <input type="checkbox"/> EPA Protocol Qualitative <input type="checkbox"/> EPA Protocol Quantitative <input type="checkbox"/> EMSL MSD 9000 Method fibers/gram	<b>XRD</b> <input type="checkbox"/> Asbestos <input type="checkbox"/> Silica NIOSH 7500  <b>OTHER</b> <input type="checkbox"/>

Client Sample # (s)

Total Samples #:

Relinquished:

Date:

9/22/08

Time:

15:41

Received:

Date:

9/22/08

Time:

1541

R. K. Mahoney EMSL



## CHAIN OF CUSTODY

Revised January 1, 2000

SAMPLE NUMBER	SAMPLE DESCRIPTION/LOCATION			VOLUME (If Applicable)
3	9/17/08	OSHA	mile marker 1312	1435.2 ✓
6	↓			1425.6 ✓
7				1425.6 ✓
8	↓			1420.8 ✓
13	9/19/08		mile marker 1331.5	<sup>1322.4</sup> <del>1329.6</del> ✓
14	↓			1320 ✓
15	↓			1322.4 ✓
16	↓			1341.6 ✓
20	9/19/08		mile marker 1331	698.4 ✓
22	↓			691.2 ✓
23	↓			698.4 ✓
24	↓			705.6 ✓
31	9/22		mile marker 1329.5	974.4 ✓





EMSL Analytical, Inc.

Asbestos

## CHAIN OF CUSTODY

Revised January 1, 2000

EMSL Rep:

Your Company Name:

Street:

Box #:

City/State:

EMSL Analytical, Inc.

107 4<sup>th</sup> Street West

Libby, MT

Zip: 59923

Bill to:

Street:

City/State:

EMSL, Inc

Scott Carnay

Duluth, MN Zip:

Phone Results to: Name:

Telephone #:

Project Name/Number:

Fax Results to: Name:

Fax #:

Purchase Order #:

## MATRIX

## TURNAROUND

<input checked="" type="checkbox"/> Air	<input type="checkbox"/> Soil	<input type="checkbox"/> Micro-Vac	<input type="checkbox"/> 3 hrs	<input type="checkbox"/> 6 Hours	<input type="checkbox"/> Same Day or 12 Hours*	<input type="checkbox"/> 24 Hours (1 day)
<input type="checkbox"/> Bulk	<input type="checkbox"/> Drinking Water		<input type="checkbox"/> 48 Hours (2 days)	<input type="checkbox"/> 72 Hours (3 days)	<input type="checkbox"/> 96 Hours (4 days)	<input checked="" type="checkbox"/> 120 Hours (5 Days)
<input type="checkbox"/> Wipe	<input type="checkbox"/> Wastewater		<input type="checkbox"/> 144+ hours (6-10 Days)			

TEM AIR, 3 hours, 6 hours, Please call ahead to schedule. There is a premium charge for 3-hour tat; please call 1-800-220-3675 for price prior to sending samples. You will be asked to sign an authorization form for this service.

\*12 hours (must arrive by 11:00 a.m Mon - Fri.), Please Refer to Price Quote

## PCM - Air

- ☐ NIOSH 7400(A) Issue 2: August 1994  
☐ OSHA w/ TWA  
☐ Other:

## PLM - Bulk

- ☐ EPA 600/R-93/116  
☐ EPA Point Count  
☐ NYS Stratified Point Count  
☐ PLM NOB (Gravimetric) NYS 198.1  
☐ NIOSH 9002  
☐ EMSL Standard Addition

## SEM Air or Bulk

- ☐ Qualitative  
☐ Quantitative

## TEM Air

- ☐ AHERA 40 CFR, Part 763 Subpart E  
☐ NIOSH 7402 Issue 2  
☐ EPA Level II

## TEM Bulk

- ☐ Drop Mount (Qualitative)  
☐ Chatfield SOP - 1988-02  
☐ TEM NOB (Gravimetric) NYS 198.4  
☐ EMSL Standard Addition

## PLM Soil

- ☐ EPA Protocol Qualitative  
☐ EPA Protocol Quantitative  
☐ EMSL MSD 9000 Method fibers/gram

## TEM Water

- ☐ EPA 100.1  
☐ EPA 100.2  
☐ NYS 198.2

## TEM Microvac/Wipe

- ☐ ASTM D 5755-95 quantitative  
☐ Wipe Qualitative

## XRD

- ☐ Asbestos  
☐ Silica NIOSH 7500

## OTHER

☐

Client Sample # (s)

Relinquished:

Received:

Total Samples #:

Date:

Date:

Time:

Time:

7/31/08

9/23/08

1345

1345



EMSL Analytical, Inc.

Asbestos

# CHAIN OF CUSTODY

Revised January 1, 2000

SAMPLE NUMBER	SAMPLE DESCRIPTION/LOCATION		VOLUME (If Applicable)
39	9/23/08	OCHA mile marker 1377	792
40	9/23/08	✓ <del>✓</del>	918



EMSL Analytical, Inc.

Asbestos

## CHAIN OF CUSTODY

Revised January 1, 2000

EMSL Rep:

Your Company Name:

EMSL Analytical, Inc.

Street:

107 4<sup>th</sup> Street West

Box #:

City/State:

Libby, MT

Zip:

59923

Bill to:

Street:

City/State:

Fax Results to: Name:

Phone Results to: Name:

Telephone #:

Fax #:

Project Name/Number:

Purchase Order #:

## MATRIX

## TURNAROUND

<input checked="" type="checkbox"/> Air	<input type="checkbox"/> Soil	<input type="checkbox"/> Micro-Vac	<input type="checkbox"/> 3 hrs	<input type="checkbox"/> 6 Hours	<input type="checkbox"/> Same Day or 12 Hours*	<input type="checkbox"/> 24 Hours (1 day)
<input type="checkbox"/> Bulk	<input type="checkbox"/> Drinking Water	<input type="checkbox"/> 48 Hours (2 days)	<input type="checkbox"/> 72 Hours (3 days)	<input type="checkbox"/> 96 Hours (4 days)	<input checked="" type="checkbox"/> 120 Hours (5 days)	
<input type="checkbox"/> Wipe	<input type="checkbox"/> Wastewater	<input type="checkbox"/> 144+ hours (6-10 Days)				

TEM AIR, 3 hours, 6 hours, Please call ahead to schedule. There is a premium charge for 3-hour tat; please call 1-800-220-3675 for price prior to sending samples. You will be asked to sign an authorization form for this service.

\*12 hours (must arrive by 11:00 a.m Mon - Fri.), Please Refer to Price Quote

## PCM - Air

- ☐ NIOSH 7400(A) Issue 2: August 1994  
☐ OSHA w/ TWA  
☐ Other:

## PLM - Bulk

- ☐ EPA 600/R-93/116  
☐ EPA Point Count  
☐ NYS Stratified Point Count  
☐ PLM NOB (Gravimetric) NYS 198.1  
☐ NIOSH 9002  
☐ EMSL Standard Addition

## SEM Air or Bulk

- ☐ Qualitative  
☐ Quantitative

## TEM Air

- ☐ AHERA 40 CFR, Part 763 Subpart E  
☐ NIOSH 7402 Issue 2  
☐ EPA Level II

## TEM Bulk

- ☐ Drop Mount (Qualitative)  
☐ Chatfield SOP - 1988-02  
☐ TEM NOB (Gravimetric) NYS 198.4  
☐ EMSL Standard Addition

## PLM Soil

- ☐ EPA Protocol Qualitative  
☐ EPA Protocol Quantitative  
☐ EMSL MSD 9000 Method fibers/gram

## TEM Water

- ☐ EPA 100.1  
☐ EPA 100.2  
☐ NYS 198.2

## TEM Microvac/Wipe

- ☐ ASTM D 5755-95 quantitative  
☐ Wipe Qualitative

## XRD

- ☐ Asbestos  
☐ Silica NIOSH 7500

## OTHER

☐

Client Sample # (s)

Total Samples #:

Relinquished:

Date:

9/25/08

Time:

1221

Received:

Date:

9/25/08

Time:

1321





EMSL Analytical, Inc.

Asbestos

# CHAIN OF CUSTODY

Revised January 1, 2000

SAMPLE NUMBER	SAMPLE DESCRIPTION/LOCATION			VOLUME (If Applicable)
47	9/24/08	OS/TA	mile marker 1339.5	964
48	✓	✓	✓	967

**ATTACHMENT C**  
**TEM ANALYTICAL DATA**



**EMSL Analytical, Inc.**

107 Haddon Avenue

Westmont, New Jersey 08108

Phone: (856) 858-4800

Fax: (856) 858-9551

**EMSL**

SM

**LETTER OF TRANSMITTAL**

To:	Scott Carney	Date:	January 19, 2009
	EMR, Inc.	From:	Charles E. LaCerra
	11 East Superior Street	Re:	Libby, MT BNSF Work
	Suite 260		Mobile Lab Analytical Reports
	Duluth, MN 55802		See Below
	Phone: 763-277-5200		

**We are sending you:**      **× Attached**      **Under separate cover via**

<input type="checkbox"/> Solicitation	<input type="checkbox"/> Copy of Letter	<input type="checkbox"/> Invoice #'s See Below
<input type="checkbox"/> Subcontract	<input type="checkbox"/> As noted	<input type="checkbox"/> Other
<input type="checkbox"/> Laboratory Samples	<input checked="" type="checkbox"/> Analytical Reports	

**These are transmitted as indicated below:**

<input type="checkbox"/> Execute ___ Original(s)	<input type="checkbox"/> Review & Comment	<input type="checkbox"/> For Approval
<input type="checkbox"/> Return ___ Original(s)	<input type="checkbox"/> As Requested	<input type="checkbox"/> Respond as instructed
<input checked="" type="checkbox"/> For Your Information/File		<input type="checkbox"/> Other

**Remarks:**

Enclosed please find one (1) copy of the following mobile lab analytical reports for analysis for your review and use for the above referenced project:

270800923

Please feel free to contact me with any questions or if you require additional information

Copy to: \_\_\_\_\_ Signed: Charles LaCerra

# INTERNAL CHAIN OF CUSTODY

9/23/2008 11:04:09 AM

Order ID: 270800923

Attn: Scott Carney  
EMR, Inc.  
11 East Superior Street  
Suite 260  
Duluth, MN 55802

Fax: (218) 625-2337

Phone: (218) 625-2332

Project: **BNSF**  
Samples collected 9/17, 18, 19, & 22/2008

Customer ID: EMR178  
Customer PO:  
Received: 09/22/08 3:41 PM

EMSL Order: 270800923  
EMSL Proj ID: BNSF Libby, MT 2008  
Cust COC ID

Invoice to Burlington N. Santa Fe/BNSF Rlwy (BURL54), 2500 Lou Menk Drive, Fort Worth, TX 76131

**Test:** TEM ISO 10312 **Matrix:** Air **TAT:** 120 Hour **Qty:** 13

**Acct Sts:** **Slspnsn:** epodell **Logged:** jwyattpescador **Date:** 9/22/2008

**Billing Frequency:** With Report

**Sample Condition:** ☒ Acceptable  
☐ Unacceptable

Comments

- ☐ Exempt from prep charge  
☐ Exempt from lab opening fee  
☐ Exempt from layer/aliquot charges

**Prepped:** RCM **Date:** 9/25/08  
**Analyzed:** RCM **Date:** 9/30/08  
**Data Entry:** LR **Date:** 10/1/08  
**Screened:** KL **Date:** 10/1/08  
**Mailed:** KL **Date:** 10/2/08

## Special Instructions

Pre Hardcopy review 1-16-09 by KL

Order ID	Lab Sample #	Cust. Sample #	Location	Due Date
270800923	270800923-0001	3 •		9/27/2008 3:41:00 PM
270800923	270800923-0002	6 •		9/27/2008 3:41:00 PM
270800923	270800923-0003	7 •		9/27/2008 3:41:00 PM
270800923	270800923-0004	8 •		9/27/2008 3:41:00 PM
270800923	270800923-0005	13 •		9/27/2008 3:41:00 PM
270800923	270800923-0006	14 •		9/27/2008 3:41:00 PM
270800923	270800923-0007	15 •		9/27/2008 3:41:00 PM
270800923	270800923-0008	16 •		9/27/2008 3:41:00 PM
270800923	270800923-0009	20 •		9/27/2008 3:41:00 PM
270800923	270800923-0010	22 •		9/27/2008 3:41:00 PM
270800923	270800923-0011	23 •		9/27/2008 3:41:00 PM

2708-EMR-49



**BNSF 2008 Libby Site Investigation v32h**  
**TEM Asbestos Structure Count -- ISO 10312**

**SAMPLE ID**

Status Analyzed  
 EPA Sample Number 3  
 QA Type Not QA  
 Lab Sample Number 270800923-0001  
 Sample Type Air  
 Category Field  
 Prep Direct  
 Counting Rules 10312

**PARAMETERS**

Effective filter area 385.0 mm<sup>2</sup>  
 Indirect factor 1.00E+00  
 Number of Grid Openings (amphibole) 10  
 Number of Grid Openings (chrysotile) 10  
 Grid opening area 0.0130 mm<sup>2</sup>  
 Volume (L) or Area (cm<sup>2</sup>) 1435.2 L  
 Sensitivity (amphibole) 2.06E-03 s/cc  
 Sensitivity (chrysotile) 2.06E-03 s/cc

**Recording**  
**Rules:**

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

**Stopping**  
**Rules:**

Target S	Max GOs	Max N
0.0024		50

**COUNTS (based on countable structures only)**

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	0	0	0		
b	0	0	0		
c	0	0	0		
d	0	0	0		
e	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK  
 Grand total 0 OK

**CONCENTRATION (s/cc)**

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	<DL	<DL	<DL		
b	<DL	<DL	<DL		
c	<DL	<DL	<DL		
d	<DL	<DL	<DL		
e	<DL	<DL	<DL		
f	<DL	<DL	<DL		
Total	<DL	<DL	<DL	<DL	<DL

Type	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	a			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	c		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	e	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

FILE NAME: 6 270800923-0002 ISO 09-30-08 D.xls

FILE TYPE: Original

## BNSF 2008 Libby Site Investigation v32h

## TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	JEOL 100 CX (30)
Voltage (KV)	100 kV
Magnification	19,000 X
Grid opening area (mm2)	0.0130
Scale: 1L =	1.000
Scale: 1D =	1.000
Primary filter area (mm2)	385.0
Secondary Filter Area (mm2)	360.0
Category	Field
Filter Status	Analyzed

EPA Sample Number:	6
Sample Type	Air
Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	1425.6
Date received by lab	9/22/2008
Lab Job Number:	270800923
Lab Sample Number:	270800923-0002
Number of grids prepared	3
Prepared by	R. Pescador
Preparation date	9/25/2008
EPA COC Number	0923

Analyzed by	R. Mahoney
Analysis date	9/30/2008
Prep	Direct
If sample type = air, is there loose material or debris in the bowl?	No
Counting rules	ISO (Air or Dust)
Grid storage location	2708-EMR-49, A
Archive filter(s) storage location	Westmont
F- factor	
QA Type	Not QA

## Recording Rules:

≥ 3:1	Minimum Aspect Ratio
0.50	Minimum Length (um)
none	Minimum Width (um)

## Stopping Rules:

0.00240	Target Sensitivity
9	GOs required to reach target sensitivity
	Maximum # of GOs
50	Maximum # of Structures
9	Estimated # of GOs

## F-factor Calculation:

## Indirect Prep Inputs

	Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]
	First resuspension volume or rinsate volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

## Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

## Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
	F-factor

Grid opening traverse direction:

V

## COMMENTS



3 270800923-0001 ISO 09-30-08 D.xls

ERROR CHECK
OK - No errors found

QA by:	K. Lusher
QA date:	10/1/2008

**Target Sensitivity Reached-Complete current GO, then stop**

[illegible]

**BNSF 2008 Libby Site Investigation v32h**  
**TEM Asbestos Structure Count -- ISO 10312**

**SAMPLE ID**

Status Analyzed  
 EPA Sample Number 6  
 QA Type Not QA  
 Lab Sample Number 270800923-0002  
 Sample Type Air  
 Category Field  
 Prep Direct  
 Counting Rules 10312

**PARAMETERS**

Effective filter area 385.0 mm2  
 Indirect factor 1.00E+00  
 Number of Grid Openings (amphibole) 10  
 Number of Grid Openings (chrysotile) 10  
 Grid opening area 0.0130 mm2  
 Volume (L) or Area (cm2) 1425.6 L  
 Sensitivity (amphibole) 2.08E-03 s/cc  
 Sensitivity (chrysotile) 2.08E-03 s/cc

**Recording**  
**Rules:**

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

**Stopping**  
**Rules:**

Target S	Max GOs	Max N
0.0024		50

**COUNTS (based on countable structures only)**

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	0	0	0		
b	0	0	0		
c	0	0	0		
d	0	0	0		
e	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK

Grand total 0 OK

**CONCENTRATION (s/cc)**

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	<DL	<DL	<DL		
b	<DL	<DL	<DL		
c	<DL	<DL	<DL		
d	<DL	<DL	<DL		
e	<DL	<DL	<DL		
f	<DL	<DL	<DL		
Total	<DL	<DL	<DL	<DL	<DL

Type	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	a			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	c		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	e	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

FILE NAME: 6 270800923-0002 ISO 09-30-08 D.xls

FILE TYPE: Original

## BNSF 2008 Libby Site Investigation v32h

## TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	JEOL 100 CX (30)
Voltage (KV)	100 kV
Magnification	19,000 X
Grid opening area (mm2)	0.0130
Scale: 1L =	1.000
Scale: 1D =	1.000
Primary filter area (mm2)	385.0
Secondary Filter Area (mm2)	360.0
Category	Field
Filter Status	Analyzed

EPA Sample Number:	6
Sample Type	Air
Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	1425.6
Date received by lab	9/22/2008
Lab Job Number:	270800923
Lab Sample Number:	270800923-0002
Number of grids prepared	3
Prepared by	R. Pescador
Preparation date	9/25/2008
EPA COC Number	0923

Analyzed by	R. Mahoney
Analysis date	9/30/2008
Prep	Direct
If sample type = air, is there loose material or debris in the bowl?	No
Counting rules	ISO (Air or Dust)
Grid storage location	2708-EMR-49, A
Archive filter(s) storage location	Westmont
F- factor	1
QA Type	Not QA

## Recording Rules:

≥ 3:1	Minimum Aspect Ratio
0.50	Minimum Length (um)
none	Minimum Width (um)

## Stopping Rules:

0.00240	Target Sensitivity
9	GOs required to reach target sensitivity
	Maximum # of GOs
50	Maximum # of Structure
9	Estimated # of GOs

## F-factor Calculation:

## Indirect Prep Inputs

	Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]
	First resuspension volume or rinsate volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

## Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

## Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
	F-factor

Grid opening traverse direction:	V
----------------------------------	---

## COMMENTS



## 6\_270800923-0002\_ISO\_09-30-08\_D.xls

6  
270800923-0002

Prep	Direct
QA Type	Not QA

OK - No errors found

L. Ramowski
10/1/2008

QA by:	K. Lusher
QA date:	10/2/2008

**Target Sensitivity Reached-Complete current GO, then stop**

[illegible]

**BNSF 2008 Libby Site Investigation v32h**  
**TEM Asbestos Structure Count -- ISO 10312**

**SAMPLE ID**

Status Analyzed  
 EPA Sample Number 7  
 QA Type Not QA  
 Lab Sample Number 270800923-0003  
 Sample Type Air  
 Category Field  
 Prep Direct  
 Counting Rules 10312

**PARAMETERS**

Effective filter area 385.0 mm2  
 Indirect factor 1.00E+00  
 Number of Grid Openings (amphibole) 10  
 Number of Grid Openings (chrysotile) 10  
 Grid opening area 0.0130 mm2  
 Volume (L) or Area (cm2) 1425.6 L  
 Sensitivity (amphibole) 2.08E-03 s/cc  
 Sensitivity (chrysotile) 2.08E-03 s/cc

**Recording**  
**Rules:**

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

**Stopping**  
**Rules:**

Target S	Max GOs	Max N
0.0024		50

**COUNTS (based on countable structures only)**

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	0	0	0		
b	0	0	0		
c	0	0	0		
d	0	0	0		
e	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK

Grand total 0 OK

**CONCENTRATION (s/cc)**

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	<DL	<DL	<DL		
b	<DL	<DL	<DL		
c	<DL	<DL	<DL		
d	<DL	<DL	<DL		
e	<DL	<DL	<DL		
f	<DL	<DL	<DL		
Total	<DL	<DL	<DL	<DL	<DL

Type	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	a			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	c		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	e	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

FILE NAME: 7 270800923-0003 ISO 09-30-08 D.xls

FILE TYPE: Original

## BNSF 2008 Libby Site Investigation v32h

## TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	JEOL 100 CX (30)
Voltage (KV)	100 kV
Magnification	19,000 X
Grid opening area (mm2)	0.0130
Scale: 1L =	1.000
Scale: 1D =	1.000
Primary filter area (mm2)	385.0
Secondary Filter Area (mm2)	360.0
Category	Field
Filter Status	Analyzed

EPA Sample Number:	7
Sample Type	Air
Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	1425.6
Date received by lab	9/22/2008
Lab Job Number:	270800923
Lab Sample Number:	270800923-0003
Number of grids prepared	3
Prepared by	R. Pescador
Preparation date	9/25/2008
EPA COC Number	0923

Analyzed by	R. Mahoney
Analysis date	9/30/2008
Prep	Direct
If sample type = air, is there loose material or debris in the bowl?	No
Counting rules	ISO (Air or Oust)
Grid storage location	2708-EMR-49, B
Archive filter(s) storage location	Westmont
F- factor	1
QA Type	Not QA

## Recording Rules:

≥ 3:1	Minimum Aspect Ratio
0.50	Minimum Length (um)
none	Minimum Width (um)

## Stopping Rules:

0.00240	Target Sensitivity
9	GOs required to reach target sensitivity
	Maximum # of GOs
50	Maximum # of Structures
9	Estimated # of GOs

## F-factor Calculation:

## Indirect Prep Inputs

	Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]
	First resuspension volume or rinsate volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

## Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

## Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
--	--

F-factor

Grid opening traverse direction: V

## COMMENTS



7 270800923-0003 ISO 09-30-08 D.xls

ERROR CHECK
OK - No errors found

QA by:	K. Lusher
QA date:	10/2/2008

**Target Sensitivity Reached-Complete current GO, then stop.**

[illegible]

**BNSF 2008 Libby Site Investigation v32h**  
**TEM Asbestos Structure Count -- ISO 10312**

**SAMPLE ID**

Status Analyzed  
 EPA Sample Number 8  
 QA Type Not QA  
 Lab Sample Number 270800923-0004  
 Sample Type Air  
 Category Field  
 Prep Direct  
 Counting Rules 10312

**PARAMETERS**

Effective filter area 385.0 mm2  
 Indirect factor 1.00E+00  
 Number of Grid Openings (amphibole) 10  
 Number of Grid Openings (chrysotile) 10  
 Grid opening area 0.0130 mm2  
 Volume (L) or Area (cm2) 1420.8 L  
 Sensitivity (amphibole) 2.08E-03 s/cc  
 Sensitivity (chrysotile) 2.08E-03 s/cc

**Recording**  
**Rules:**

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

**Stopping**  
**Rules:**

Target S	Max GOs	Max N
0.0024		50

**COUNTS (based on countable structures only)**

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	0	0	0		
b	0	0	0		
c	0	0	0		
d	0	0	0		
e	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK  
 Grand total 0 OK

**CONCENTRATION (s/cc)**

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	<DL	<DL	<DL		
b	<DL	<DL	<DL		
c	<DL	<DL	<DL		
d	<DL	<DL	<DL		
e	<DL	<DL	<DL		
f	<DL	<DL	<DL		
Total	<DL	<DL	<DL	<DL	<DL

Type	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	a			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	c		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	e	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

FILE NAME: 8\_270800923-0004 ISO\_09-30-08 D.xls

FILE TYPE: Original

## BNSF 2008 Libby Site Investigation v32h

## TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	JEOL 100 CX (30)
Voltage (KV)	100 kV
Magnification	19,000 X
Grid opening area (mm2)	0.0130
Scale: 1L =	1.000
Scale: 1D =	1.000
Primary filter area (mm2)	385.0
Secondary Filter Area (mm2)	360.0
Category	Field
Filter Status	Analyzed

EPA Sample Number:	8
Sample Type	Air
Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	1420.8
Date received by lab	9/22/2008
Lab Job Number:	270800923
Lab Sample Number:	270800923-0004
Number of grids prepared	3
Prepared by	R. Pescador
Preparation date	9/25/2008
EPA COC Number	0923

Analyzed by	R. Mahoney
Analysis date	9/30/2008
Prep	Direct
If sample type = air, is there loose material or debris in the bowl?	No
Counting rules	ISO (Air or Dust)
Grid storage location	2708-EMR-49, B
Archive filter(s) storage location	Westmont
F- factor	1
QA Type	Not QA

## Recording Rules:

≥ 3:1	Minimum Aspect Ratio
0.50	Minimum Length (um)
none	Minimum Width (um)

## Stopping Rules:

0.00240	Target Sensitivity
9	GOs required to reach target sensitivity
	Maximum # of GOs
50	Maximum # of Structure
9	Estimated # of GOs

## F-factor Calculation:

## Indirect Prep Inputs

	Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]
	First resuspension volume or rinsate volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

## Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

## Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
	F-factor

Grid opening traverse direction:

V

## COMMENTS



## 8\_270800923-0004\_ISO\_09-30-08\_D.xls

<b>ERROR CHECK</b>
OK - No errors found

QA by:	K. Lusher
QA date:	10/2/2008

**Target Sensitivity Reached-Complete current GO, then stop.**

[illegible]

**BNSF 2008 Libby Site Investigation v32h**  
**TEM Asbestos Structure Count -- ISO 10312**

**SAMPLE ID**

Status Analyzed  
EPA Sample Number 13  
QA Type Not QA  
Lab Sample Number 270800923-0005  
Sample Type Air  
Category Field  
Prep Direct  
Counting Rules 10312

**PARAMETERS**

Effective filter area 385.0 mm2  
Indirect factor 1.00E+00  
Number of Grid Openings (amphibole) 10  
Number of Grid Openings (chrysotile) 10  
Grid opening area 0.0130 mm2  
Volume (L) or Area (cm2) 1322.4 L  
Sensitivity (amphibole) 2.24E-03 s/cc  
Sensitivity (chrysotile) 2.24E-03 s/cc

**Recording Rules:**

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

**Stopping Rules:**

Target S	Max GOs	Max N
0.0024		50

**COUNTS (based on countable structures only)**

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	0	0	0		
b	0	0	0		
c	0	0	0		
d	0	0	0		
e	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK

Grand total 0 OK

**CONCENTRATION (s/cc)**

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	<DL	<DL	<DL		
b	<DL	<DL	<DL		
c	<DL	<DL	<DL		
d	<DL	<DL	<DL		
e	<DL	<DL	<DL		
f	<DL	<DL	<DL		
Total	<DL	<DL	<DL	<DL	<DL

Type	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	a			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	c		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	e	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

FILE NAME: 13\_270800923-0005\_ISO\_09-30-08\_D.xls

FILE TYPE: Original

## BNSF 2008 Libby Site Investigation v32h

## TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	JEOL 100 CX (30)
Voltage (KV)	100 kV
Magnification	19,000 X
Grid opening area (mm2)	0.0130
Scale: 1L =	1.000
Scale: 1D =	1.000
Primary filter area (mm2)	385.0
Secondary Filter Area (mm2)	360.0
Category	Field
Filter Status	Analyzed

EPA Sample Number:	13
Sample Type	Air
Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	1322.4
Date received by lab	9/22/2008
Lab Job Number:	270800923
Lab Sample Number:	270800923-0005
Number of grids prepared	3
Prepared by	R. Pescador
Preparation date	9/25/2008
EPA COC Number	0923

Analyzed by	R. Mahoney
Analysis date	9/30/2008
Prep	Direct
If sample type = air, is there loose material or debris in the bowl?	No
Counting rules	ISO (Air or Dust)
Grid storage location	2708-EMR-49, C
Archive filter(s) storage location	Westmont
F- factor	
QA Type	Not QA

## Recording Rules:

≥ 3:1	Minimum Aspect Ratio
0.50	Minimum Length (um)
none	Minimum Width (um)

## Stopping Rules:

0.00240	Target Sensitivity
10	GOs required to reach target sensitivity
	Maximum # of GOs
50	Maximum # of Structure
10	Estimated # of GOs

## F-factor Calculation:

## Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing  
[For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

## Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

## Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction:

V

## COMMENTS



## 13\_270800923-0005\_ISO\_09-30-08 D.xls

OK - No errors found

QA by:	K. Lusher
QA date:	10/2/2008

**Target Sensitivity Reached-Complete current GO, then stop.**

[illegible]

**BNSF 2008 Libby Site Investigation v32h**  
**TEM Asbestos Structure Count -- ISO 10312**

**SAMPLE ID**

Status Analyzed  
 EPA Sample Number 14  
 QA Type Not QA  
 Lab Sample Number 270800923-0006  
 Sample Type Air  
 Category Field  
 Prep Direct  
 Counting Rules 10312

**PARAMETERS**

Effective filter area 385.0 mm2  
 Indirect factor 1.00E+00  
 Number of Grid Openings (amphibole) 10  
 Number of Grid Openings (chrysotile) 10  
 Grid opening area 0.0130 mm2  
 Volume (L) or Area (cm2) 1320 L  
 Sensitivity (amphibole) 2.24E-03 s/cc  
 Sensitivity (chrysotile) 2.24E-03 s/cc

**Recording**  
**Rules:**

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

**Stopping**  
**Rules:**

Target S	Max GOs	Max N
0.0024		50

**COUNTS (based on countable structures only)**

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	0	0	0		
b	0	0	0		
c	0	0	0		
d	0	0	0		
e	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK  
 Grand total 0 OK

**CONCENTRATION (s/cc)**

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	<DL	<DL	<DL		
b	<DL	<DL	<DL		
c	<DL	<DL	<DL		
d	<DL	<DL	<DL		
e	<DL	<DL	<DL		
f	<DL	<DL	<DL		
Total	<DL	<DL	<DL	<DL	<DL

Type	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	a			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	c		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	e	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

FILE NAME: 14: 270800923-0006: ISO\_09-30-08.D.xls

FILE TYPE: Original

## BNSF 2008 Libby Site Investigation v32h

## TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	JEOL 100 CX (30)
Voltage (KV)	100 kV
Magnification	19,000 X
Grid opening area (mm2)	0.0130
Scale: 1L =	1.000
Scale: 1D =	1.000
Primary filter area (mm2)	385.0
Secondary Filter Area (mm2)	360.0
Category	Field
Filter Status	Analyzed

EPA Sample Number:	14
Sample Type	Air
Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	1320.0
Date received by lab	9/22/2008
Lab Job Number:	270800923
Lab Sample Number:	270800923-0006
Number of grids prepared	3
Prepared by	R. Pescador
Preparation date	9/25/2008
EPA COC Number	0923

Analyzed by	R. Mahoney
Analysis date	9/30/2008
Prep	Direct
if sample type = air, is there loose material or debris in the bowl?	No
Counting rules	ISO (Air or Dust)
Grid storage location	2708-EMR-49, C
Archive filter(s) storage location	Westmont
F- factor	1
QA Type	Not QA

## Recording Rules:

≥ 3:1	Minimum Aspect Ratio
0.50	Minimum Length (um)
none	Minimum Width (um)

## Stopping Rules:

0.00240	Target Sensitivity
10	GOs required to reach target sensitivity
	Maximum # of GOs
50	Maximum # of Structure
10	Estimated # of GOs

## F-factor Calculation:

## Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing  
[For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

## Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

## Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction:

V

## COMMENTS



14 270800923-0006 ISO 09-30-08 D.xls

ERROR CHECK
OK - No errors found

QA by:	K. Lusher
QA date:	10/2/2008

**Target Sensitivity Reached-Complete current GO, then stop.**

[illegible]

**BNSF 2008 Libby Site Investigation v32h**  
**TEM Asbestos Structure Count -- ISO 10312**

**SAMPLE ID**

Status Analyzed  
 EPA Sample Number 15  
 QA Type Not QA  
 Lab Sample Number 270800923-0007  
 Sample Type Air  
 Category Field  
 Prep Direct  
 Counting Rules 10312

**PARAMETERS**

Effective filter area 385.0 mm2  
 Indirect factor 1.00E+00  
 Number of Grid Openings (amphibole) 10  
 Number of Grid Openings (chrysotile) 10  
 Grid opening area 0.0130 mm2  
 Volume (L) or Area (cm2) 1322.4 L  
 Sensitivity (amphibole) 2.24E-03 s/cc  
 Sensitivity (chrysotile) 2.24E-03 s/cc

**Recording**  
**Rules:**

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

**Stopping**  
**Rules:**

Target S	Max GOs	Max N
0.0024		50

**COUNTS (based on countable structures only)**

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	0	0	0		
b	0	0	0		
c	0	0	0		
d	0	0	0		
e	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK

Grand total 0 OK

**CONCENTRATION (s/cc)**

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	<DL	<DL	<DL		
b	<DL	<DL	<DL		
c	<DL	<DL	<DL		
d	<DL	<DL	<DL		
e	<DL	<DL	<DL		
f	<DL	<DL	<DL		
Total	<DL	<DL	<DL	<DL	<DL

Type	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	a			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	c		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	e	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

FILE NAME: 15-270800923-0007 ISO 09-30-08 D.xls

FILE TYPE: Original

## BNSF 2008 Libby Site Investigation v32h

## TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	JEOL 100 CX (30)
Voltage (KV)	100 kV
Magnification	19,000 X
Grid opening area (mm2)	0.0130
Scale: 1L =	1.000
Scale: 1D =	1.000
Primary filter area (mm2)	385.0
Secondary Filter Area (mm2)	360.0
Category	Field
Filter Status	Analyzed

EPA Sample Number:	15
Sample Type	Air
Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	1322.4
Date received by lab	9/22/2008
Lab Job Number:	270800923
Lab Sample Number:	270800923-0007
Number of grids prepared	3
Prepared by	R. Pescador
Preparation date	9/25/2008
EPA COC Number	0923

Analyzed by	R. Mahoney
Analysis date	9/30/2008
Prep	Direct
If sample type = air, is there loose material or debris in the container?	No
Counting rules	ISO (Air or Dust)
Grid storage location	2708-EMR-49, D
Archive filter(s) storage location	Westmont
F- factor	1
QA Type	Not QA

## Recording Rules:

≥ 3:1	Minimum Aspect Ratio
0.50	Minimum Length (um)
none	Minimum Width (um)

## Stopping Rules:

0.00240	Target Sensitivity
10	GOs required to reach target sensitivity
	Maximum # of GOs
50	Maximum # of Structure
10	Estimated # of GOs

## F-factor Calculation:

## Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing  
[For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

## Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

## Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction:

V

## COMMENTS



15 270800923-0007 ISO 09-30-08 D.xls

OK - No errors found

QA by:	K. Lusher
QA date:	10/2/2008

**Target Sensitivity Reached-Complete current GO, then stop.**

[illegible]

**BNSF 2008 Libby Site Investigation v32h**  
**TEM Asbestos Structure Count -- ISO 10312**

**SAMPLE ID**

Status Analyzed  
 EPA Sample Number 16  
 QA Type Not QA  
 Lab Sample Number 270800923-0008  
 Sample Type Air  
 Category Field  
 Prep Direct  
 Counting Rules 10312

**PARAMETERS**

Effective filter area 385.0 mm<sup>2</sup>  
 Indirect factor 1.00E+00  
 Number of Grid Openings (amphibole) 10  
 Number of Grid Openings (chrysotile) 10  
 Grid opening area 0.0130 mm<sup>2</sup>  
 Volume (L) or Area (cm<sup>2</sup>) 1341.6 L  
 Sensitivity (amphibole) 2.21E-03 s/cc  
 Sensitivity (chrysotile) 2.21E-03 s/cc

**Recording**  
**Rules:**

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

**Stopping**  
**Rules:**

Target S	Max GOs	Max N
0.0024		50

**COUNTS (based on countable structures only)**

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	0	0	0		
b	0	0	0		
c	0	0	0		
d	0	0	0		
e	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK

Grand total 0 OK

**CONCENTRATION (s/cc)**

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	<DL	<DL	<DL		
b	<DL	<DL	<DL		
c	<DL	<DL	<DL		
d	<DL	<DL	<DL		
e	<DL	<DL	<DL		
f	<DL	<DL	<DL		
Total	<DL	<DL	<DL	<DL	<DL

Type	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	a			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	c		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	e	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

FILE NAME: 16\_270800923-0008\_ISO\_09-30-08\_D.xls

FILE TYPE: Original

## BNSF 2008 Libby Site Investigation v32h

## TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	JEOL 100 CX (30)
Voltage (KV)	100 kV
Magnification	19,000 X
Grid opening area (mm2)	0.0130
Scale: 1L =	1.000
Scale: 1D =	1.000
Primary filter area (mm2)	385.0
Secondary Filter Area (mm2)	360.0
Category	Field
Filter Status	Analyzed

EPA Sample Number:	18
Sample Type	Air
Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	1341.6
Date received by lab	9/22/2008
Lab Job Number:	270800923
Lab Sample Number:	270800923-0008
Number of grids prepared	3
Prepared by	R. Pescador
Preparation date	9/25/2008
EPA COC Number	0923

Analyzed by	R. Mahoney
Analysis date	9/30/2008
Prep	Direct
If sample type = air, is there loose material or debris in the bowl?	No
Counting rules	ISO (Air or Dust)
Grid storage location	2708-EMR-49, D
Archive filter(s) storage location	Westmont
F- factor	1
QA Type	Not QA

## Recording Rules:

≥ 3:1	Minimum Aspect Ratio
0.50	Minimum Length (um)
none	Minimum Width (um)

## Stopping Rules:

0.00240	Target Sensitivity
10	GOs required to reach target sensitivity
50	Maximum # of GOs
10	Estimated # of GOs

## F-factor Calculation:

## Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing  
[For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

## Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

## Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction:

V

## COMMENTS

16\_270800923-0008\_ISO\_09-30-08\_D.xls

ERROR CHECK
OK - No errors found

QA by:	K. Lusher
QA date:	10/2/2008

**Target Sensitivity Reached-Complete current GO, then stop.**

[illegible]



**BNSF 2008 Libby Site Investigation v32h**  
**TEM Asbestos Structure Count -- ISO 10312**
**SAMPLE ID**

Status Analyzed  
EPA Sample Number 20  
QA Type Not QA  
Lab Sample Number 270800923-0009  
Sample Type Air  
Category Field  
Prep Direct  
Counting Rules 10312

**PARAMETERS**

Effective filter area 385.0 mm<sup>2</sup>  
Indirect factor 1.00E+00  
Number of Grid Openings (amphibole) 19  
Number of Grid Openings (chrysotile) 19  
Grid opening area 0.0130 mm<sup>2</sup>  
Volume (L) or Area (cm<sup>2</sup>) 698.4 L  
Sensitivity (amphibole) 2.23E-03 s/cc  
Sensitivity (chrysotile) 2.23E-03 s/cc

**Recording Rules:**

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

**Stopping Rules:**

Target S	Max GOs	Max N
0.0024		50

**COUNTS (based on countable structures only)**

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	0	0	0		
b	0	0	0		
c	0	0	0		
d	0	0	0		
e	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK

Grand total 0 OK

**CONCENTRATION (s/cc)**

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	<DL	<DL	<DL		
b	<DL	<DL	<DL		
c	<DL	<DL	<DL		
d	<DL	<DL	<DL		
e	<DL	<DL	<DL		
f	<DL	<DL	<DL		
Total	<DL	<DL	<DL	<DL	<DL

Type	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	a			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	c		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	e	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

FILE NAME: 20\_270800923-0009\_ISO\_09-30-08\_D.xls

FILE TYPE: Original

## BNSF 2008 Libby Site Investigation v32h

## TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	JEOL 100 CX (30)
Voltage (KV)	100 kV
Magnification	19,000 X
Grid opening area (mm2)	0.0130
Scale: 1L =	1.000
Scale: 1D =	1.000
Primary filter area (mm2)	385.0
Secondary Filter Area (mm2)	360.0
Category	Field
Filter Status	Analyzed

EPA Sample Number:	20
Sample Type	Air
Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	698.4
Date received by lab	9/22/2008
Lab Job Number:	270800923
Lab Sample Number:	270800923-0009
Number of grids prepared	3
Prepared by	R. Pescador
Preparation date	9/25/2008
EPA COC Number	0923

Analyzed by	R. Mahoney
Analysis date	9/30/2008
Prep	Direct
If sample type = air, is there loose material or debris in the bowl?	No
Counting rules	ISO (Air or Dust)
Grid storage location	2708-EMR-49, E
Archive filter(s) storage location	Westmont
F- factor	1
QA Type	Not QA

## Recording Rules:

≥ 3:1	Minimum Aspect Ratio
0.50	Minimum Length (um)
none	Minimum Width (um)

## Stopping Rules:

0.00240	Target Sensitivity
18	GOs required to reach target sensitivity
	Maximum # of GOs
50	Maximum # of Structure
18	Estimated # of GOs

## F-factor Calculation:

## Indirect Prep Inputs

	Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]
	First resuspension volume or rinsate volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

## Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

## Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
	F-factor

Grid opening traverse direction:

V

## COMMENTS

## 20\_270800923-0009\_ISO\_09-30-08\_D.xls

ERROR CHECK
OK - No errors found

QA by:	K. Lusher
QA date:	10/2/2008

[illegible]



**BNSF 2008 Libby Site Investigation v32h**  
**TEM Asbestos Structure Count -- ISO 10312**

**SAMPLE ID**

Status Analyzed  
EPA Sample Number 22  
QA Type Not QA  
Lab Sample Number 270800923-0010  
Sample Type Air  
Category Field  
Prep Direct  
Counting Rules 10312

**PARAMETERS**

Effective filter area 385.0 mm2  
Indirect factor 1.00E+00  
Number of Grid Openings (amphibole) 19  
Number of Grid Openings (chrysotile) 19  
Grid opening area 0.0130 mm2  
Volume (L) or Area (cm2) 691.2 L  
Sensitivity (amphibole) 2.26E-03 s/cc  
Sensitivity (chrysotile) 2.26E-03 s/cc

**Recording Rules:**

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

**Stopping Rules:**

Target S	Max GOs	Max N
0.0024		50

**COUNTS (based on countable structures only)**

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	0	0	0		
b	0	0	0		
c	0	0	0		
d	0	0	0		
e	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK  
Grand total 0 OK

**CONCENTRATION (s/cc)**

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	<DL	<DL	<DL		
b	<DL	<DL	<DL		
c	<DL	<DL	<DL		
d	<DL	<DL	<DL		
e	<DL	<DL	<DL		
f	<DL	<DL	<DL		
Total	<DL	<DL	<DL	<DL	<DL

Type	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	a			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	c		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	e	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1



FILE NAME: 22\_270800923-0010\_ISO\_09-30-08\_D.xls

FILE TYPE: Original

## BNSF 2008 Libby Site Investigation v32h

## TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	JEOL 100 CX (30)
Voltage (KV)	100 kV
Magnification	19,000 X
Grid opening area (mm2)	0.0130
Scale: 1L =	1.000
Scale: 1D =	1.000
Primary filter area (mm2)	385.0
Secondary Filter Area (mm2)	360.0
Category	Field
Filter Status	Analyzed

EPA Sample Number:	22
Sample Type	Air
Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	691.2
Date received by lab	9/22/2008
Lab Job Number:	270800923
Lab Sample Number:	270800923-0010
Number of grids prepared	3
Prepared by	R. Pescador
Preparation date	9/25/2008
EPA COC Number	0923

Analyzed by	R. Mahoney
Analysis date	9/30/2008
Prep	Direct
If sample type = air, is there loose material or debris in the container?	No
Counting rules	ISO (Air or Dust)
Grid storage location	2708-EMR-49, E
Archive filter(s) storage location	Westmont
F- factor	1.0
QA Type	Not QA

## Recording Rules:

≥ 3:1	Minimum Aspect Ratio
0.50	Minimum Length (um)
none	Minimum Width (um)

## Stopping Rules:

0.00240	Target Sensitivity
18	GOs required to reach target sensitivity
	Maximum # of GOs
50	Maximum # of Structure
18	Estimated # of GOs

## F-factor Calculation:

## Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing  
[For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

## Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

## Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction: V

## COMMENTS

22 270800923-0010\_ISO\_09-30-08\_D.xls

ERROR CHECK
OK - No errors found

QA by:	K. Lusher
QA date:	10/2/2008

Target Sensitivity Reached-Complete current GO, then stop.

[illegible]

**BNSF 2008 Libby Site Investigation v32h**  
**TEM Asbestos Structure Count -- ISO 10312**

**SAMPLE ID**

Status Analyzed  
 EPA Sample Number 23  
 QA Type Not QA  
 Lab Sample Number 270800923-0011  
 Sample Type Air  
 Category Field  
 Prep Direct  
 Counting Rules 10312

**PARAMETERS**

Effective filter area 385.0 mm2  
 Indirect factor 1.00E+00  
 Number of Grid Openings (amphibole) 19  
 Number of Grid Openings (chrysotile) 19  
 Grid opening area 0.0130 mm2  
 Volume (L) or Area (cm2) 698.4 L  
 Sensitivity (amphibole) 2.23E-03 s/cc  
 Sensitivity (chrysotile) 2.23E-03 s/cc

**Recording**  
**Rules:**

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

**Stopping**  
**Rules:**

Target S	Max GOs	Max N
0.0024		50

**COUNTS (based on countable structures only)**

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	0	0	0		
b	0	0	0		
c	0	0	0		
d	0	0	0		
e	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK  
 Grand total 0 OK

**CONCENTRATION (s/cc)**

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	<DL	<DL	<DL		
b	<DL	<DL	<DL		
c	<DL	<DL	<DL		
d	<DL	<DL	<DL		
e	<DL	<DL	<DL		
f	<DL	<DL	<DL		
Total	<DL	<DL	<DL	<DL	<DL

Type	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	a			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	c		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	e	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1



FILE NAME: 23\_270800923-0011\_ISO 09-30-08 D.xls

FILE TYPE: Original

## BNSF 2008 Libby Site Investigation v32h

## TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	JEOL 100 CX (30)
Voltage (KV)	100 kV
Magnification	19,000 X
Grid opening area (mm2)	0.0130
Scale: 1L =	1.000
Scale: 1D =	1.000
Primary filter area (mm2)	385.0
Secondary Filter Area (mm2)	360.0
Category	Field
Filter Status	Analyzed

EPA Sample Number:	23
Sample Type	Air
Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	698.4
Date received by lab	9/22/2008
Lab Job Number:	270800923
Lab Sample Number:	270800923-0011
Number of grids prepared	3
Prepared by	R. Pescador
Preparation date	9/25/2008
EPA COC Number	0923

Analyzed by	R. Mahoney
Analysis date	9/30/2008
Prep	Direct
If sample type = air, is there loose material or debris in the bowl?	No
Counting rules	ISO (Air or Dust)
Grid storage location	2708-EMR-49, F
Archive filter(s) storage location	Westmont
F- factor	1
QA Type	Not QA

## Recording Rules:

≥ 3:1	Minimum Aspect Ratio
0.50	Minimum Length (um)
none	Minimum Width (um)

## Stopping Rules:

0.00240	Target Sensitivity
18	GOs required to reach target sensitivity
	Maximum # of GOs
50	Maximum # of Structure
18	Estimated # of GOs

## F-factor Calculation:

## Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing  
[For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

## Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

## Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction:

V

## COMMENTS

23\_270800923-0011\_ISO\_09-30-08\_D.xls

ERROR CHECK
OK - No errors found

QA by:	K. Lusher
QA date:	10/2/2008

**Target Sensitivity Reached-Complete current GO, then stop.**

[illegible]



**BNSF 2008 Libby Site Investigation v32h**  
**TEM Asbestos Structure Count -- ISO 10312**

**SAMPLE ID**

Status Analyzed  
EPA Sample Number 24  
QA Type Not QA  
Lab Sample Number 270800923-0012  
Sample Type Air  
Category Field  
Prep Direct  
Counting Rules 10312

**PARAMETERS**

Effective filter area 385.0 mm2  
Indirect factor 1.00E+00  
Number of Grid Openings (amphibole) 20  
Number of Grid Openings (chrysotile) 20  
Grid opening area 0.0130 mm2  
Volume (L) or Area (cm2) 705.6 L  
Sensitivity (amphibole) 2.10E-03 s/cc  
Sensitivity (chrysotile) 2.10E-03 s/cc

**Recording Rules:**

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

**Stopping Rules:**

Target S	Max GOs	Max N
0.0024		50

**COUNTS (based on countable structures only)**

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	0	0	0		
b	0	0	0		
c	0	0	0		
d	0	0	0		
e	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK  
Grand total 0 OK

**CONCENTRATION (s/cc)**

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	<DL	<DL	<DL		
b	<DL	<DL	<DL		
c	<DL	<DL	<DL		
d	<DL	<DL	<DL		
e	<DL	<DL	<DL		
f	<DL	<DL	<DL		
Total	<DL	<DL	<DL	<DL	<DL

Type	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	a			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	c		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	e	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1



FILE NAME: 24: 270800923-0012 ISO 09-30-08 D.xls

FILE TYPE: Original

## BNSF 2008 Libby Site Investigation v32h

## TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	JEOL 100 CX (30)
Voltage (KV)	100 kV
Magnification	19,000 X
Grid opening area (mm2)	0.0130
Scale: 1L =	1.000
Scale: 1D =	1.000
Primary filter area (mm2)	365.0
Secondary Filter Area (mm2)	360.0
Category	Field
Filter Status	Analyzed

EPA Sample Number:	24
Sample Type	Air
Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	705.6
Date received by lab	9/22/2008
Lab Job Number:	270800923
Lab Sample Number:	270800923-0012
Number of grids prepared	3
Prepared by	R. Pescador
Preparation date	9/25/2008
EPA COC Number	0923

Analyzed by	R. Mahoney
Analysis date	9/30/2008
Prep	Direct
If sample type = air, is there loose material or debris in the bowl?	No
Counting rules	ISO (Air or Dust)
Grid storage location	2708-EMR-49, F
Archive filter(s) storage location	Westmont
F- factor	1
QA Type	Not QA

## Recording Rules:

≥ 3:1	Minimum Aspect Ratio
0.50	Minimum Length (um)
none	Minimum Width (um)

## Stopping Rules:

0.00240	Target Sensitivity
18	GOs required to reach target sensitivity
	Maximum # of GOs
50	Maximum # of Structures
18	Estimated # of GOs

## F-factor Calculation:

## Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing  
[For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

## Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

## Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction:	V
----------------------------------	---

## COMMENTS

24 270800923-0012 ISO 09-30-08 D.xls

ERROR CHECK
OK - No errors found

QA by:	K. Lusher
QA date:	10/2/2008

**Target Sensitivity Reached-Complete current GO, then stop.**

[illegible]

**BNSF 2008 Libby Site Investigation v32h**  
**TEM Asbestos Structure Count -- ISO 10312**

**SAMPLE ID**

Status Analyzed  
EPA Sample Number 31  
QA Type Not QA  
Lab Sample Number 270800923-0013  
Sample Type Air  
Category Field  
Prep Direct  
Counting Rules 10312

**PARAMETERS**

Effective filter area 385.0 mm2  
Indirect factor 1.00E+00  
Number of Grid Openings (amphibole) 15  
Number of Grid Openings (chrysotile) 15  
Grid opening area 0.0130 mm2  
Volume (L) or Area (cm2) 974.4 L  
Sensitivity (amphibole) 2.03E-03 s/cc  
Sensitivity (chrysotile) 2.03E-03 s/cc

**Recording Rules:**

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

**Stopping Rules:**

Target S	Max GOs	Max N
0.0024		50

**COUNTS (based on countable structures only)**

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	0	0	0		
b	0	0	0		
c	0	0	0		
d	0	0	0		
e	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK

Grand total 0 OK

**CONCENTRATION (s/cc)**

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	<DL	<DL	<DL		
b	<DL	<DL	<DL		
c	<DL	<DL	<DL		
d	<DL	<DL	<DL		
e	<DL	<DL	<DL		
f	<DL	<DL	<DL		
Total	<DL	<DL	<DL	<DL	<DL

Type	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	a			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	c		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	e	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1



FILE NAME: 31-270800923-0013 ISO 09-30-08 D.xls

FILE TYPE: Original

## BNSF 2008 Libby Site Investigation v32h

## TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	JEOL 100 CX (30)
Voltage (KV)	100 kV
Magnification	19,000 X
Grid opening area (mm2)	0.0130
Scale: 1L =	1.000
Scale: 1D =	1.000
Primary filter area (mm2)	385.0
Secondary Filter Area (mm2)	360.0
Category	Field
Filter Status	Analyzed

EPA Sample Number:	31
Sample Type	Air
Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	974.4
Date received by lab	9/22/2008
Lab Job Number:	270800923
Lab Sample Number:	270800923-0013
Number of grids prepared	3
Prepared by	R. Pescador
Preparation date	9/25/2008
EPA COC Number	0923

Analyzed by	R. Mahoney
Analysis date	9/30/2008
Prep	Direct
If sample type = air, is there loose material or debris in the bowl?	No
Counting rules	ISO (Air or Dust)
Grid storage location	2708-EMR-49, G
Archive filter(s) storage location	Westmont
F- factor	
QA Type	Not QA

## Recording Rules:

≥ 3:1	Minimum Aspect Ratio
0.50	Minimum Length (um)
none	Minimum Width (um)

## Stopping Rules:

0.00240	Target Sensitivity
13	GOs required to reach target sensitivity
	Maximum # of GOs
50	Maximum # of Structure
13	Estimated # of GOs

## F-factor Calculation:

## Indirect Prep Inputs

	Fraction of primary filter used for indirect prep or ashing (For dust and dustfall, enter 1.0)
	First resuspension volume or rinsate volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

## Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

## Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
--	--

F-factor

Grid opening traverse direction:

V

## COMMENTS

## 31\_270800923-0013\_ISO\_09-30-08\_D.xls

ERROR CHECK
OK - No errors found

QA by:	K. Lusher
QA date:	10/2/2008

**Target Sensitivity Reached-Complete current GO, then stop.**

[illegible]

**BNSF 2008 Libby Site Investigation v32h**  
**TEM Asbestos Structure Count -- ISO 10312**

**SAMPLE ID**

Status Analyzed  
EPA Sample Number 0  
QA Type LB  
Lab Sample Number 270800923  
Sample Type Air  
Category Blank  
Prep Direct  
Counting Rules 10312

**PARAMETERS**

Effective filter area 385.0 mm2  
Indirect factor 1.00E+00  
Number of Grid Openings (amphibole) 10  
Number of Grid Openings (chrysotile) 10  
Grid opening area 0.0130 mm2  
Volume (L) or Area (cm2) 0 L  
Sensitivity (amphibole) Blank s/cc  
Sensitivity (chrysotile) Blank s/cc

**Recording Rules:**

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

**Stopping Rules:**

Target S	Max GOs	Max N
	10	50

**COUNTS (based on countable structures only)**

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	0	0	0		
b	0	0	0		
c	0	0	0		
d	0	0	0		
e	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK  
Grand total 0 OK

**CONCENTRATION (s/cc)**

Bin	LA	OA	C	PCME(all)	PCME(asb)
a					
b					
c					
d					
e					
f					
Total					<DL

Type	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	a			<5
OA = Other amphibole	b	<.5		≥ 5
C = Chrysotile	c		>.5	≥ 5
	d	≥.5 to < 5	≤.5	≥ 5
	e	5 to 10	≤.5	≥ 5
	f	>10	≤.5	≥ 5

PCME: Length > 5 um, Width ≥ 0.25 um, Aspect Ratio ≥ 3:1



270800923 ISO 09-30-08 DLB.xls

OK - No errors found

QA by:	K. Lusher
QA date:	10/2/2008

**Maximum # of Grid Openings Reached-Complete current GO then stop**

[illegible]

FILE NAME: 270800923\_ISO\_09-30-08\_DLB.xls

FILE TYPE: Original

## BNSF 2008 Libby Site Investigation v32h

## TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	JEOL 100 CX (30)
Voltage (KV)	100 kV
Magnification	19,000 X
Grid opening area (mm2)	0.0130
Scale: 1L =	1.000
Scale: 1D =	1.000
Primary filter area (mm2)	385.0
Secondary Filter Area (mm2)	360.0
Category	Blank
Filter Status	Analyzed

EPA Sample Number:	
Sample Type	Air
Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	
Date received by lab	
Lab Job Number:	270800923
Lab Sample Number:	270800923
Number of grids prepared	2
Prepared by	R. Pescador
Preparation date	9/25/2008
EPA COC Number	0923

Analyzed by	R. Mahoney
Analysis date	9/30/2008
Prep	Direct
If sample type = air, is there loose material or debris in the bowl?	No
Counting rules	ISO (Air or Dust)
Grid storage location	2708-EMR-48, G
Archive filter(s) storage location	Westmont
F- factor	1
QA Type	Lab Blank

## Recording Rules:

≥ 3:1	Minimum Aspect Ratio
0.50	Minimum Length (um)
none	Minimum Width (um)

## Stopping Rules:

	Target Sensitivity
10	GOs required to reach target sensitivity
10	Maximum # of GOs
50	Maximum # of Structures
10	Estimated # of GOs

## F-factor Calculation:

## Indirect Prep Inputs

	Fraction of primary filter used for indirect prep or ashing (For dust and dustfall, enter 1.0)
	First resuspension volume or rinsate volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

## Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

## Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
	F-factor

Grid opening traverse direction:

V

## COMMENTS

**BNSF 2008 Libby Site Investigation v32h  
TEM Asbestos Structure Count**

Laboratory name:	EMSL27
Instrument	JEOL 100 CX (30)
Voltage (KV)	100
Magnification	19,000 X
Grid opening area (mm <sup>2</sup> )	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm <sup>2</sup> )	385
Secondary Filter Area (mm <sup>2</sup> )	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	3
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm <sup>2</sup> ), or dustfall container area (cm <sup>2</sup> )	1435.2
Date received by lab	9/22/08
Lab Job Number:	270800923
Lab Sample Number:	270800923-0001
Number of grids prepared	3
Prepared by	R. Pescador
Preparation date	9/25/08
EPA COC Number:	0923
Secondary filter pore size (um)	0.2

Analyzed by	R. Mahoney
Analysis date	9/30/08
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
If sample type = air, is there loose material or debris in the bowl? (Yes, No)	No
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	2708-EMR-49, A
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

## F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right—&gt;

## Recording Rules:

Minimum Aspect Ratio (circle one):

none ≥ 3:1 ≥ 5:1

Minimum Length (um): 0.5

Minimum Width (um): None

## Stopping Rules:

Target Sensitivity: 0.0024

Max # of GOs: 9

Target # of Structures: 50

## F-factor Calculation:

## Indirect Prep Inputs

<input type="text"/>	Fraction of primary filter used for Indirect prep or ashing [For dust and dustfall, enter 1.0]
<input type="text"/>	First resuspension volume or rinsate volume (mL)
<input type="text"/>	Volume applied to secondary filter (mL) or used for serial dilution

## Inputs for Serial Dilutions

<input type="text"/>	Second resuspension volume (mL)
<input type="text"/>	Volume applied to secondary filter (mL) or used for serial dilution
<input type="text"/>	Third resuspension volume (mL)
<input type="text"/>	Volume applied to secondary filter (mL)

## Input for Ashing of Secondary Filter

<input type="text"/>	Fraction of secondary filter used for ashing
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Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Sketch/ Comments	1 = yes, blank = no			Fract. GO Chrys.
			Primary	Total	Length	Width		LA	OA	C	NAM		Sketch	Photo	EDS	
1	G4	ND														
	G6	ND														
	G8	ND														
	D4	ND														
	D6	ND														
3	G3	ND														
	G5	ND														
	G7	ND														
	G9	ND														
	F8	ND														

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Grid opening traverse direction (circle one):

H Horizontal

V VerticalAre prepped grids acceptable for analysis? (circle one) Yes No

If No, explain:



**BNSF 2008 Libby Site Investigation v32h  
TEM Asbestos Structure Count**

Laboratory name:	EMSL27
Instrument	JEOL 100 CX (30)
Voltage (KV)	100
Magnification	19,000 X
Grid opening area (mm <sup>2</sup> )	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm <sup>2</sup> )	385
Secondary Filter Area (mm <sup>2</sup> )	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	6
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm <sup>2</sup> ), or dustfall container area (cm <sup>2</sup> )	1425.6
Date received by lab	9/22/08
Lab Job Number:	270800923
Lab Sample Number:	270800923-0002
Number of grids prepared	3
Prepared by	R. Pescador
Preparation date	9/25/08
EPA COC Number:	0923
Secondary filter pore size (um)	0.2

Analyzed by	R. Mahoney
Analysis date	9/30/08
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
If sample type = air, is there loose material or debris in the bowl? (Yes, No)	No
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	2708-EMR-49, A
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right—>

<b>Recording Rules:</b>		
Minimum Aspect Ratio (circle one):		
none	≥ 3:1	≥ 5:1
Minimum Length (um):		0.5
Minimum Width (um):		None

<b>Stopping Rules:</b>	
Target Sensitivity:	0.0024
Max # of GOs:	9
Target # of Structures:	50

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Sketch/ Comments	1 = yes, blank = no			Fract. GO Chrys.
			Primary	Total	Length	Width		LA	OA	C	NAM		Sketch	Photo	EDS	
1	E9	ND														
	E7	ND														
	E5	ND														
	E3	ND														
	E1	ND														
2	G2	ND														
	G4	ND														
	G6	ND														
	G8	ND														
	E9	ND														

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Grid opening traverse direction (circle one):

H Horizontal  
☒ V Vertical

Are prepped grids acceptable for analysis? (circle one) ☒ Yes ☐ No

If No, explain:

F-factor Calculation:

Indirect Prep Inputs

	Fraction of primary filter used for indirect prep or ashing (For dust and dustfall, enter 1.0)
	First resuspension volume or rinsate volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
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**BNSF 2008 Libby Site Investigation v32h  
TEM Asbestos Structure Count**

Laboratory name:	EMSL27
Instrument	JEOL 100 CX (30)
Voltage (KV)	100
Magnification	19,000 X
Grid opening area (mm <sup>2</sup> )	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm <sup>2</sup> )	385
Secondary Filter Area (mm <sup>2</sup> )	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	7
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm <sup>2</sup> ), or dustfall container area (cm <sup>2</sup> )	1425.6
Date received by lab	9/22/08
Lab Job Number:	270800923
Lab Sample Number:	270800923-0003
Number of grids prepared	3
Prepared by	R. Pescador
Preparation date	9/25/08
EPA COC Number:	0923
Secondary filter pore size (um)	0.2

Analyzed by	R. Mahoney
Analysis date	9/30/08
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
If sample type = air, is there loose material or debris in the cow? (Yes, No)	No
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	2708-EMR-49, B
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

**F-Factor Calculation (Indirect Preps Only):**

Enter data in appropriate cells provided to the right—>

<b>Recording Rules:</b>	
Minimum Aspect Ratio (circle one):	none <u>≥ 3:1</u> ≥ 5:1
Minimum Length (um):	0.5
Minimum Width (um):	None

<b>Stopping Rules:</b>	
Target Sensitivity:	0.0024
Max # of GOs:	9
Target # of Structures:	50

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Sketch/ Comments	1 = yes, blank = no			Fract. GO Chrys.
			Primary	Total	Length	Width		LA	OA	C	NAM		Sketch	Photo	EDS	
1	H9	ND														
1	H7	ND														
1	H5	ND														
1	H3	ND														
1	H1	ND														
2	D9	ND														
1	D7	ND														
1	D5	ND														
1	D3	ND														
1	D1	ND														

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Grid opening traverse direction (circle one):

H Horizontal  
☒ V Vertical

Are prepped grids acceptable for analysis? (circle one) Yes No

If No, explain:

**F-factor Calculation:**

**Indirect Prep Inputs**

	Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]
	First resuspension volume or rinsate volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

**Inputs for Serial Dilutions**

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

**Input for Ashing of Secondary Filter**

	Fraction of secondary filter used for ashing
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**BNSF 2008 Libby Site Investigation v32h  
TEM Asbestos Structure Count**

Laboratory name:	EMSL27
Instrument	JEOL 100 CX (30)
Voltage (KV)	100
Magnification	19,000 X
Grid opening area (mm <sup>2</sup> )	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm <sup>2</sup> )	385
Secondary Filter Area (mm <sup>2</sup> )	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	8
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm <sup>2</sup> ), or dustfall container area (cm <sup>2</sup> )	1420.8
Date received by lab	9/17/08
Lab Job Number:	270800923
Lab Sample Number:	270800923-0004
Number of grids prepared	3
Prepared by	R. Pescador
Preparation date	9/25/08
EPA COC Number:	0923
Secondary filter pore size (um)	0.2

Analyzed by	R. Mahoney
Analysis date	9/30/08
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
If sample type = air, is there loose material or debris in the bowl? (Yes, No)	No
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	2708-EMR-49, B
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

## F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right—&gt;

<b>Recording Rules:</b>		
Minimum Aspect Ratio (circle one):		
none	≥ 3:1	≥ 5:1
Minimum Length (um):		0.5
Minimum Width (um):		None

**Stopping Rules:**

Target Sensitivity:	0.0024
Max # of GOs:	9
Target # of Structures:	50

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Sketch/ Comments	1 = yes, blank = no			Fract. GO Chrys.
			Primary	Total	Length	Width		LA	OA	C	NAM		Sketch	Photo	EDS	
1	G2	ND														
↓	G4	ND														
	G6	ND														
	G8	ND														
↓	G10	ND														
2	H9	ND														
↓	H7	ND														
	H5	ND														
	H3	ND														
↓	H1	ND														

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Grid opening traverse direction (circle one):

H Horizontal  
☒ V Vertical

Are prepped grids acceptable for analysis? (circle one) ☒ Yes ☐ No

If No, explain:

**F-factor Calculation:****Indirect Prep Inputs**

	Fraction of primary filter used for Indirect prep or ashing [For dust and dustfall, enter 1.0]
	First resuspension volume or rinse volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

**Inputs for Serial Dilutions**

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

**Input for Ashing of Secondary Filter**

	Fraction of secondary filter used for ashing
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TEM Asbestos Structure Count**

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Laboratory name:	EMSL27
Instrument	JEOL 100 CX (30)
Voltage (KV)	100
Magnification	19,000 X
Grid opening area (mm <sup>2</sup> )	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm <sup>2</sup> )	385
Secondary Filter Area (mm <sup>2</sup> )	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	13
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm <sup>2</sup> ), or dustfall container area (cm <sup>2</sup> )	1322.4
Date received by lab	9/22/08
Lab Job Number:	270800923
Lab Sample Number:	270800923-0005
Number of grids prepared	3
Prepared by	R. Pescador
Preparation date	9/25/08
EPA COC Number:	0923
Secondary filter pore size (um)	0.2

Analyzed by	R. Mahoney
Analysis date	9/30/08
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
If sample type = air, is there loose material or debris in the bowl? (Yes, No)	No
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	2708-EMR-49, C
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

**F-Factor Calculation (Indirect Preps Only):**

Enter data in appropriate cells provided to the right—>

<b>Recording Rules:</b>	
Minimum Aspect Ratio (circle one):	none <u>≥ 3:1</u> ≥ 5:1
Minimum Length (um):	0.5
Minimum Width (um):	None

<b>Stopping Rules:</b>	
Target Sensitivity:	0.0024
Max # of GOs:	10
Target # of Structures:	50

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Sketch/ Comments	1 = yes, blank = no			Fract. GO Chrys.
			Primary	Total	Length	Width		LA	OA	C	NAM		Sketch	Photo	EDS	
1	09	ND														
↓	07	ND														
↓	05	ND														
↓	03	ND														
↓	01	ND														
2	12	ND														
↓	14	ND														
↓	16	ND														
↓	18	ND														
↓	110	ND														

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Grid opening traverse direction (circle one):

H Horizontal  
V Vertical

Are prepped grids acceptable for analysis? (circle one) Yes No

If No, explain:

**F-factor Calculation:**

**Indirect Prep Inputs**

	Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]
	First resuspension volume or rinsate volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

**Inputs for Serial Dilutions**

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

**Input for Ashing of Secondary Filter**

	Fraction of secondary filter used for ashing
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**BNSF 2008 Libby Site Investigation v32h  
TEM Asbestos Structure Count**

Laboratory name:	EMSL27
Instrument	JEOL 100 CX (30)
Voltage (KV)	100
Magnification	19,000 X
Grid opening area (mm <sup>2</sup> )	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm <sup>2</sup> )	385
Secondary Filter Area (mm <sup>2</sup> )	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	14
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm <sup>2</sup> ), or dustfall container area (cm <sup>2</sup> )	1320
Date received by lab	9/21/08
Lab Job Number:	270800923
Lab Sample Number:	270800923-0006
Number of grids prepared	3
Prepared by	R. Pescador
Preparation date	9/25/08
EPA COC Number:	0923
Secondary filter pore size (um)	0.2

Analyzed by	R. Mahoney
Analysis date	9/30/08
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
If sample type = air, is there loose material or debris in the bowl? (Yes, No)	No
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	2708-EMR-49, C
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

**F-Factor Calculation (Indirect Preps Only):**

Enter data in appropriate cells provided to the right—>

**Recording Rules:**

Minimum Aspect Ratio (circle one):

none ≥ 3:1 ≥ 5:1

Minimum Length (um): 0.5

Minimum Width (um): None

**Stopping Rules:**

Target Sensitivity: 0.0024

Max # of GOs: 10

Target # of Structures: 50

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Sketch/ Comments	1 = yes, blank = no			Fract. GO Chrys.
			Primary	Total	Length	Width		LA	OA	C	NAM		Sketch	Photo	EDS	
1	H2	ND														
1	H4	ND														
1	H6	ND														
1	H8	ND														
1	H10	ND														
2	H2	ND														
1	H4	ND														
1	H6	ND														
1	H8	ND														
1	H10	ND														

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Grid opening traverse direction (circle one):

H Horizontal

V Vertical

Are prepped grids acceptable for analysis? (circle one) Yes No

If No, explain:

**F-factor Calculation:**

**Indirect Prep Inputs**

Fraction of primary filter used for indirect prep or ashing  
(For dust and dustfall, enter 1.0)  
First resuspension volume or rinsate volume (mL)  
Volume applied to secondary filter (mL) or used for serial dilution

**Inputs for Serial Dilutions**

Second resuspension volume (mL)  
Volume applied to secondary filter (mL) or used for serial dilution  
Third resuspension volume (mL)  
Volume applied to secondary filter (mL)

**Input for Ashing of Secondary Filter**

Fraction of secondary filter used for ashing

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TEM Asbestos Structure Count**

Laboratory name:	EMSL27
Instrument	JEOL 100 CX (30)
Voltage (KV)	100
Magnification	19,000 X
Grid opening area (mm <sup>2</sup> )	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm <sup>2</sup> )	385
Secondary Filter Area (mm <sup>2</sup> )	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	15
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm <sup>2</sup> ), or dustfall container area (cm <sup>2</sup> )	1322.4
Date received by lab	9/21/08
Lab Job Number:	270800923
Lab Sample Number:	270800923-0007
Number of grids prepared	3
Prepared by	R. Pescador
Preparation date	9/25/08
EPA COC Number:	0923
Secondary filter pore size (um)	0.2

Analyzed by	R. Mahoney
Analysis date	9/30/08
Method (D=Direct, i=Indirect, IA=Indirect, ashed)	D
If sample type = air, is there loose material or debris in the bowl? (Yes, No)	No
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	2708-EMR-49, D
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

## F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right—&gt;

## Recording Rules:

Minimum Aspect Ratio (circle one):

none ≥ 3:1 ≥ 5:1

Minimum Length (um): 0.5

Minimum Width (um): None

## Stopping Rules:

Target Sensitivity: 0.0024

Max # of GOs: 10

Target # of Structures: 50

## F-factor Calculation:

## Indirect Prep Inputs

	Fraction of primary filter used for indirect prep or ashing (For dust and dustfall, enter 1.0)
	First resuspension volume or rinsate volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

## Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

## Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
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Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Sketch/ Comments	1 = yes, blank = no			Fract. GO Chrys.
			Primary	Total	Length	Width		LA	OA	C	NAM		Sketch	Photo	EDS	
1	C2	ND														
1	C4	ND														
1	C6	ND														
1	C8	ND														
1	C10	ND														
2	B2	ND														
1	B4	ND														
1	B6	ND														
1	B8	ND														
1	B10	ND														

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Grid opening traverse direction (circle one):

H Horizontal  
☒ V Vertical

Are prepped grids acceptable for analysis? (circle one) Yes No

If No, explain:

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TEM Asbestos Structure Count**

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Laboratory name:	EMSL27
Instrument	JEOL 100 CX (30)
Voltage (KV)	100
Magnification	19,000 X
Grid opening area (mm <sup>2</sup> )	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm <sup>2</sup> )	385
Secondary Filter Area (mm <sup>2</sup> )	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	16
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm <sup>2</sup> ), or dustfall container area (cm <sup>2</sup> )	1341.6
Date received by lab	9/17/08
Lab Job Number:	270800923
Lab Sample Number:	270800923-0008
Number of grids prepared	3
Prepared by	R. Pescador
Preparation date	9/25/08
EPA COC Number:	0923
Secondary filter pore size (um)	0.2

Analyzed by	R. Mahoney
Analysis date	9/30/08
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
If sample type = air, is there loose material or debris in the bowl? (Yes, No)	No
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	2708-EMR-49, D
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

**F-Factor Calculation (Indirect Preps Only):**

Enter date in appropriate cells provided to the right—>

<b>Recording Rules:</b>		
Minimum Aspect Ratio (circle one):		
none	<u>≥ 3:1</u>	≥ 5:1
Minimum Length (um):		0.5
Minimum Width (um):		None

<b>Stopping Rules:</b>	
Target Sensitivity:	0.0024
Max # of GOs:	10
Target # of Structures:	50

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Sketch/ Comments	1 = yes, blank = no			Fract. GO Chrys.
			Primary	Total	Length	Width		LA	OA	C	NAM		Sketch	Photo	EDS	
1	G1	ND														
1	G3	ND														
1	G5	ND														
1	G7	ND														
↓	G9	ND														
2	I2	ND														
1	I4	ND														
1	I6	ND														
1	I8	ND														
↓	I10	ND														

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Grid opening traverse direction (circle one):

H Horizontal  
V Vertical

Are prepped grids acceptable for analysis? (circle one) Yes No

If No, explain:

**F-factor Calculation:**

**Indirect Prep Inputs**

	Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]
	First resuspension volume or rinsate volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

**Inputs for Serial Dilutions**

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

**Input for Ashing of Secondary Filter**

	Fraction of secondary filter used for ashing
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**BNSF 2008 Libby Site Investigation v32h  
TEM Asbestos Structure Count**

Laboratory name:	EMSL27
Instrument	JEOL 100 CX (30)
Voltage (KV)	100
Magnification	19,000 X
Grid opening area (mm <sup>2</sup> )	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm <sup>2</sup> )	385
Secondary Filter Area (mm <sup>2</sup> )	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	20
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm <sup>2</sup> ), or dustfall container area (cm <sup>2</sup> )	698.4
Date received by lab	9/21/08
Lab Job Number:	270800923
Lab Sample Number:	270800923-0009
Number of grids prepared	3
Prepared by	R. Pescador
Preparation date	9/25/08
EPA COC Number:	0923
Secondary filter pore size (um)	0.2

Analyzed by	R. Mahoney
Analysis date	9/30/08
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
If sample type = air, is there loose material or debris in the bowl? (Yes, No)	No
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	2708-EMR-49, E
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

**F-Factor Calculation (Indirect Preps Only):**

Enter data in appropriate cells provided to the right—>

**Recording Rules:**

Minimum Aspect Ratio (circle one):

none ≥ 3:1 ≥ 5:1

Minimum Length (um): 0.5

Minimum Width (um): None

**Stopping Rules:**

Target Sensitivity: 0.0024

Max # of GOs: 18

Target # of Structures: 50

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Sketch/ Comments	1 = yes, blank = no			Fract. GO Chrys.
			Primary	Total	Length	Width		LA	OA	C	NAM		Sketch	Photo	EDS	
1	D9	ND														
1	D7	ND														
	D5	ND														
	D3	ND														
	D1	ND														
	H9	ND														
	H7	ND														
	H5	ND														
	H3	ND														
↓	H1	ND														

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Grid opening traverse direction (circle one):

H Horizontal

V Vertical

Are prepped grids acceptable for analysis? (circle one) Yes No

If No, explain:

**F-factor Calculation:**

**Indirect Prep Inputs**

	Fraction of primary filter used for indirect prep or ashing (For dust and dustfall, enter 1.0)
	First resuspension volume or rinsate volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

**Inputs for Serial Dilutions**

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

**Input for Ashing of Secondary Filter**

	Fraction of secondary filter used for ashing
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2708-EMR-49, E

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Sketch/Comments	1 = yes, blank = no			Fract. GO Chrys.
			Primary	Total	Length	Width		LA	OA	C	NAM		Sketch	Photo	EDS	
2	I2	ND														
↓	I4	ND														
	I6	ND														
	I8	ND														
	I10	ND														
	G4	ND														
	G6	ND														
	G8	ND														
↓	G10	ND														
R/CM 9/30/08																

**BNSF 2008 Libby Site Investigation v32h  
TEM Asbestos Structure Count**

Page 1 of 2

Laboratory name:	EMSL27
Instrument	JEOL 100 CX (30)
Voltage (KV)	100
Magnification	19,000 X
Grid opening area (mm <sup>2</sup> )	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm <sup>2</sup> )	385
Secondary Filter Area (mm <sup>2</sup> )	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	22
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm <sup>2</sup> ), or dustfall container area (cm <sup>2</sup> )	691.2
Date received by lab	9/17/08
Lab Job Number:	270800923
Lab Sample Number:	270800923-0010
Number of grids prepared	3
Prepared by	R. Pescador
Preparation date	9/25/08
EPA COC Number:	0923
Secondary filter pore size (um)	0.2

Analyzed by	R. Mahoney
Analysis date	9/30/08
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
If sample type = air, is there loose material or debris in the cow? (Yes, No)	No
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	2708-EMR-49, E
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

**F-Factor Calculation (Indirect Preps Only):**

Enter data in appropriate cells provided to the right—>

<b>Recording Rules:</b>		
Minimum Aspect Ratio (circle one):		
none	≥ 3:1	≥ 5:1
Minimum Length (um):		0.5
Minimum Width (um):		None

<b>Stopping Rules:</b>	
Target Sensitivity:	0.0024
Max # of GOs:	18
Target # of Structures:	50

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Sketch/ Comments	1 = yes, blank = no			Fract. GO Chrys.
			Primary	Total	Length	Width		LA	OA	C	NAM		Sketch	Photo	EDS	
1	C9	ND														
1	C7	ND														
	C5	ND														
	C3	ND														
	C1	ND														
	E9	ND														
	E7	ND														
	E5	ND														
	E3	ND														
↓	E1	ND														

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Grid opening traverse direction (circle one):

H Horizontal  
V Vertical

Are prapped grids acceptable for analysis? (circle one) Yes No

If No, explain:

**F-factor Calculation:**

**Indirect Prep Inputs**

	Fraction of primary filter used for indirect prep or ashing (For dust and dustfall, enter 1.0)
	First resuspension volume or rinsate volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

**Inputs for Serial Dilutions**

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

**Input for Ashing of Secondary Filter**

	Fraction of secondary filter used for ashing
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2708-EMR-49, E

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Sketch/Comments	1 = yes, blank = no			Fract. GO Chrys.
			Primary	Total	Length	Width		LA	OA	C	NAM		Sketch	Photo	EDS	
2.	B9	ND														
	B7	ND														
	B5	ND														
	B3	ND														
	B1	ND														
	D8	ND														
	D6	ND														
	D4	ND														
✓	D2	ND														
Rem 9/30/08																



**BNSF 2008 Libby Site Investigation v32h**  
**TEM Asbestos Structure Count**

Laboratory name:	EMSL27
Instrument	JEOL 100 CX (30)
Voltage (KV)	100
Magnification	19,000 X
Grid opening area (mm <sup>2</sup> )	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm <sup>2</sup> )	385
Secondary Filter Area (mm <sup>2</sup> )	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	23
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm <sup>2</sup> ), or dustfall container area (cm <sup>2</sup> )	698.4
Date received by lab	9/22/08
Lab Job Number:	270800923
Lab Sample Number:	270800923-0011
Number of grids prepared	3
Prepared by	R. Pescador
Preparation date	9/25/08
EPA COC Number:	0923
Secondary filter pore size (um)	0.2

Analyzed by	R. Mahoney
Analysis date	9/30/08
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
If sample type = air, is there loose material or debris in the cow? (Yes, No)	No
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	2708-EMR-49, F
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interial)	Not QA

## F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right—&gt;

## Recording Rules:

Minimum Aspect Ratio (circle one):

none ≥ 3:1 ≥ 5:1

Minimum Length (um): 0.5

Minimum Width (um): None

## Stopping Rules:

Target Sensitivity: 0.0024

Max # of GOs: 18

Target # of Structures: 50

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Sketch/ Comments	1 = yes, blank = no			Fract. GO Chrys.
			Primary	Total	Length	Width		LA	OA	C	NAM		Sketch	Photo	EDS	
1	G-10	ND														
	G-8	ND														
	G-6	ND														
	G-4	ND														
	G-2	ND														
	H-9	ND														
	H-7	ND														
	H-5	ND														
	H-3	ND														
2	H-1	ND														

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Grid opening traverse direction (circle one):

H Horizontal

V VerticalAre prepped grids acceptable for analysis? (circle one) Yes No

If No, explain:

## F-factor Calculation:

## Indirect Prep Inputs

 Fraction of primary filter used for indirect prep or ashing  
 (For dust and dustfall, enter 1.0)

 First resuspension volume or rinse volume (mL)

 Volume applied to secondary filter (mL) or used for serial dilution

## Inputs for Serial Dilutions

 Second resuspension volume (mL)

 Volume applied to secondary filter (mL) or used for serial dilution

 Third resuspension volume (mL)

 Volume applied to secondary filter (mL)

## Input for Ashing of Secondary Filter

 Fraction of secondary filter used for ashing

### TEM Asbestos Structure Count

LAB NAME

EMSL27

EPA SAMPLE NO.

23

QA TYPE

LAB JOB NUMBER |

270800923

LAB SAMPLE NO.

270800923-0011

**SAMPLE TYPE**

A

Not QA

GRID STORAGE LOC.

2708-EMR-49, F

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Sketch/Comments	1 = yes, blank = no			Fract. GO Chrys.
			Primary	Total	Length	Width		LA	OA	C	NAM		Sketch	Photo	EDS	
2	H1	ND														
	H3	ND														
	H5	ND														
	H7	ND														
	H9	ND														
	B1	ND														
	B3	ND														
	B5	ND														
	B7	ND														
R/cm 9/30/08																

**BNSF 2008 Libby Site Investigation v32h  
TEM Asbestos Structure Count**

Page 1 of \_\_\_\_\_

Laboratory name:	EMSL27
Instrument	JEOL 100 CX (30)
Voltage (KV)	100
Magnification	19,000 X
Grid opening area (mm <sup>2</sup> )	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm <sup>2</sup> )	385
Secondary Filter Area (mm <sup>2</sup> )	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	24
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm <sup>2</sup> ), or dustfall container area (cm <sup>2</sup> )	705.6
Date received by lab	9/21/08
Lab Job Number:	270800923
Lab Sample Number:	270800923-0012
Number of grids prepared	3
Prepared by	R. Pescador
Preparation date	9/25/08
EPA COC Number:	0923
Secondary filter pore size (um)	0.2

Analyzed by	R. Mahoney
Analysis date	9/30/08
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
If sample type = air, is there loose material or debris in the bowl? (Yes, No)	No
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	2708-EMR-49, F
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right—>

<b>Recording Rules:</b>	
Minimum Aspect Ratio (circle one):	none <u>≥ 3:1</u> ≥ 5:1
Minimum Length (um):	0.5
Minimum Width (um):	None

<b>Stopping Rules:</b>	
Target Sensitivity:	0.0024
Max # of GOs:	18
Target # of Structures:	50

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Sketch/ Comments	1 = yes, blank = no			Fract. GO Chrys.
			Primary	Total	Length	Width		LA	OA	C	NAM		Sketch	Photo	EDS	
1	C9	ND														
1	C7	ND														
	C5	ND														
	C3	ND														
	C1	ND														
	G9	ND														
	G7	ND														
	G5	ND														
	G3	ND														
	G1	ND														

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Grid opening traverse direction (circle one):

H Horizontal  
V Vertical

Are prepped grids acceptable for analysis? (circle one) Yes No

If No, explain:

F-factor Calculation:

**Indirect Prep Inputs**

	Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]
	First resuspension volume or rinse volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

**Inputs for Serial Dilutions**

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

**Input for Ashing of Secondary Filter**

	Fraction of secondary filter used for ashing
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2708-EMR-49, F

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Sketch/Comments	1 = yes, blank = no			Fract. GO Chrys.
			Primary	Total	Length	Width		LA	OA	C	NAM		Sketch	Photo	EDS	
2	I2	ND														
↓	I4	ND														
	I6	ND														
	I8	ND														
	I10	ND														
	G2	ND														
	G4	ND														
	G6	ND														
	G8	ND														
	G10	ND														
	R/can 9/30/08															



**BNSF 2008 Libby Site Investigation v32h**  
**TEM Asbestos Structure Count**

Laboratory name:	EMSL27
Instrument	JEOL 100 CX (30)
Voltage (KV)	100
Magnification	19,000 X
Grid opening area (mm <sup>2</sup> )	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm <sup>2</sup> )	385
Secondary Filter Area (mm <sup>2</sup> )	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	31
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm <sup>2</sup> ), or dustfall container area (cm <sup>2</sup> )	974.4
Date received by lab	9/12/08
Lab Job Number:	270800923
Lab Sample Number:	270800923-0013
Number of grids prepared	3
Prepared by	R. Pescador
Preparation date	9/25/08
EPA COC Number:	0923
Secondary filter pore size (um)	0.2

Analyzed by	R. Mahoney
Analysis date	9/30/08
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
If sample type = air, is there loose material or debris in the cow? (Yes, No)	No
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	2708-EMR-49, G
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

**F-Factor Calculation (Indirect Preps Only):**

Enter data in appropriate cells provided to the right—>

<b>Recording Rules:</b>		
Minimum Aspect Ratio (circle one):		
none	≥ 3:1	≥ 5:1
Minimum Length (um):		0.5
Minimum Width (um):		None

<b>Stopping Rules:</b>	
Target Sensitivity:	0.0024
Max # of GOs:	14
Target # of Structures:	50

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Sketch/ Comments	1 = yes, blank = no			Frac. GO Chrys.
			Primary	Total	Length	Width		LA	OA	C	NAM		Sketch	Photo	EDS	
1	D10	ND														
1	D8	ND														
1	D6	ND														
1	D4	ND														
1	I9	ND														
1	I7	ND														
1	I5	ND														
1	I3	ND														
1	I1	ND														
2	H2	ND														

**F-factor Calculation:**

**Indirect Prep Inputs**

	Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]
	First resuspension volume or rinsate volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

**Inputs for Serial Dilutions**

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

**Input for Ashing of Secondary Filter**

	Fraction of secondary filter used for ashing
--	--

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Grid opening traverse direction (circle one):

H Horizontal  
 V Vertical

Are prepped grids acceptable for analysis? (circle one) Yes No

If No, explain:

2708-EMR-49, G

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Sketch/Comments	1 = yes, blank = no			Fract. GO Chrys.
			Primary	Total	Length	Width		LA	OA	C	NAM		Sketch	Photo	EDS	
2	H4	ND														
	H6	ND														
	H8	ND														
	H10	ND														
	G9	ND														
RKM 9/30/08																

**BNSF 2008 Libby Site Investigation v32h  
TEM Asbestos Structure Count**

Page 1 of 1

Laboratory name:	EMSL27
Instrument	JEOL 100 CX (30)
Voltage (KV)	100
Magnification	19,000 X
Grid opening area (mm2)	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm2)	385
Secondary Filter Area (mm2)	360
Category (Field, Rep., Dup., Blank)	Blank
Primary filter pore size (um)	0.8

EPA Sample Number:	
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm2), or dustfall container area (cm2)	0
Date received by lab	9/2/08
Lab Job Number:	270800923
Lab Sample Number:	270800923
Number of grids prepared	2
Prepared by	R. Pescador
Preparation date	9/25/08
EPA COC Number:	0923
Secondary filter pore size (um)	0.2

Analyzed by	R. Mahoney
Analysis date	9/30/08
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
If sample type = air, is there loose material or debris in the bowl? (Yes, No)	No
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	2708-EMR-49, G
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Lab Blank

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right—>

<b>Recording Rules:</b>		
Minimum Aspect Ratio (circle one):		
none	<u>≥ 3:1</u>	≥ 5:1
Minimum Length (um):		0.5
Minimum Width (um):		None

<b>Stopping Rules:</b>	
Target Sensitivity:	
Max # of GOs:	10
Target # of Structures:	50

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Sketch/ Comments	1 = yes, blank = no			Fract. GO Chrys.
			Primary	Total	Length	Width		LA	OA	C	NAM		Sketch	Photo	EDS	
1	D10	ND														
1	D8	ND														
1	D6	ND														
1	D4	ND														
1	D2	ND														
2	I2	ND														
1	I4	ND														
1	I6	ND														
1	I8	ND														
1	I10	ND														

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Grid opening traverse direction (circle one):

H Horizontal  
V Vertical

Are prepped grids acceptable for analysis? (circle one) Yes No

If No, explain:

**F-factor Calculation:**

**Indirect Prep Inputs**

	Fraction of primary filter used for indirect prep or ashing (For dust end dustfall, enter 1.0)
	First resuspension volume or rinsate volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

**Inputs for Serial Dilutions**

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

**Input for Ashing of Secondary Filter**

	Fraction of secondary filter used for ashing
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EMSL Analytical, Inc.

Asbestos

## CHAIN OF CUSTODY

Revised January 1, 2000

ORDER: 270800923  
ID#

## EMSL Rep:

Your Company Name:

EMSL Analytical, Inc.

Bill to:

EMR, Inc

Street:

107 4<sup>th</sup> Street West

Street:

Scott Carney

Box #:

City/State:

Libby, MT

Zip:

59923

City/State:

Duluth, Mn.

Zip:

Phone Results to: Name:

Scott Carney

Fax Results to: Name:

Telephone #:

Fax #:

Project Name/Number:

Purchase Order #:

## MATRIX

## TURNAROUND

<input checked="" type="checkbox"/> Air	<input type="checkbox"/> Soil	<input type="checkbox"/> Micro-Vac	<input type="checkbox"/> 3 hrs	<input type="checkbox"/> 6 Hours	<input type="checkbox"/> Same Day or 12 Hours*	<input type="checkbox"/> 24 Hours (1 day)
<input type="checkbox"/> Bulk	<input type="checkbox"/> Drinking Water		<input type="checkbox"/> 48 Hours (2 days)	<input type="checkbox"/> 72 Hours (3 days)	<input type="checkbox"/> 96 Hours (4 days)	<input checked="" type="checkbox"/> 120 Hours (5 Days)
<input type="checkbox"/> Wipe	<input type="checkbox"/> Wastewater		<input type="checkbox"/> 144+ hours (6-10 Days)			

TEM AIR, 3 hours, 6 hours, Please call ahead to schedule. There is a premium charge for 3-hour tat; please call 1-800-220-3675 for price prior to sending samples. You will be asked to sign an authorization form for this service.

\*12 hours (must arrive by 11:00 a.m Mon - Fri.), Please Refer to Price Quote

## PCM - Air

- ☐ NIOSH 7400(A) Issue 2: August 1994  
☐ OSHA w/ TWA  
☐ Other:

## PLM - Bulk

- ☐ EPA 600/R-93/116  
☐ EPA Point Count  
☐ NYS Stratified Point Count  
☐ PLM NOB (Gravimetric) NYS 198.1  
☐ NIOSH 9002

☐ EMSL Standard Addition

## SEM Air or Bulk

- ☐ Qualitative  
☐ Quantitative

## TEM Air

- ☐ AHERA 40 CFR, Part 763 Subpart E  
☐ NIOSH 7402 Issue 2  
☐ EPA Level II  
☒ ISO 10312

## TEM Bulk

- ☐ Drop Mount (Qualitative)  
☐ Chatfield SOP - 1988-02  
☐ TEM NOB (Gravimetric) NYS 198.4  
☐ EMSL Standard Addition

## PLM Soil

- ☐ EPA Protocol Qualitative  
☐ EPA Protocol Quantitative  
☐ EMSL MSD 9000 Method fibers/gram

## TEM Water

- ☐ EPA 100.1  
☐ EPA 100.2  
☐ NYS 198.2

## TEM Microvac/Wipe

- ☐ ASTM D 5755-95 quantitative  
☐ Wipe Qualitative

## XRD

- ☐ Asbestos  
☐ Silica NIOSH 7500

## OTHER

☐

Client Sample # (s)

Total Samples #:

Relinquished:

Date:

9/22/08

Time:

15:41

Received:

Date:

9/22/08

Time:

15:41

Relinquished:

Elizabeth J. Hyatt-Pescador EMSL

Date: 12/4/08

Time: 15:42

Received:

Linda Ramowski EMSL

Date: 12/19/08

Time: 9:19 AM





EMSL Analytical, Inc.

Asbestos

ORDER ID#:

270800923

## CHAIN OF CUSTODY

Revised January 1, 2000

SAMPLE NUMBER	SAMPLE DESCRIPTION/LOCATION		VOLUME (If Applicable)
3	9/17/08	OSHA mile marker 1312	1435.2 ✓
6	↓		1425.6 ✓
7	↓		1425.6 ✓
8	↓		1420.8 ✓
13	9/19/08	mile marker 1331.5	<sup>1322.4</sup> <del>1329.6</del> ✓
14	↓		1320 ✓
15	↓		1322.4 ✓
16	↓		1341.6 ✓
20	9/19/08	mile marker 1331	698.4 ✓
22	↓		691.2 ✓
23	↓		698.4 ✓
24	↓		705.6 ✓
31	9/22	mile marker 1329.5	974.4 ✓

JOMAY WYATT-PESCADOR  
406-293-9066  
EMSL ANALYTICAL, INC.  
107 WEST 4TH STREET  
LIBBY MT 59923

25 LBS

1 OF 1

**SHIP TO:**

CHARLES LACERRA  
856-858-4800 1253  
EMSL ANALYTICAL, INC.  
107 HADDON AVENUE  
WESTMONT NJ 08108-2711

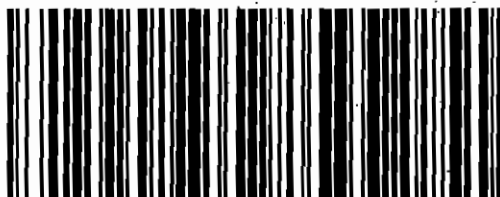


**NJ 081 9-06**



**UPS GROUND**

TRACKING #: 1Z Y84 048 03 9398 9125

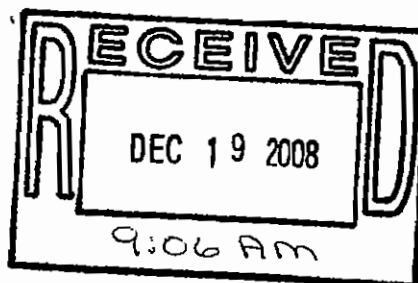


BILLING: P/P

UPS 10.6.07. WXP1E70 B4.0A 10/2008



TM



**EMSL Analytical, Inc.**

107 Haddon Avenue  
Westmont, New Jersey 08108  
Phone: (856) 858-4800  
Fax: (856) 858-9551

**LETTER OF TRANSMITTAL**

To: <u>Scott Carney</u>	Date: <u>January 26, 2009</u>
<u>EMR, Inc.</u>	From: <u>Charles E. LaCerra</u>
<u>11 East Superior Street</u>	Re: <u>Libby, MT BNSF Work</u>
<u>Suite 260</u>	<u>Mobile Lab Analytical Reports</u>
<u>Duluth, MN 55802</u>	<u>See Below</u>
<u>Phone: 763-277-5200</u>	

**We are sending you:**      **× Attached**      **Under separate cover via** \_\_\_\_\_

<input type="checkbox"/> Solicitation	<input type="checkbox"/> Copy of Letter	<input type="checkbox"/> Invoice #'s <u>See Below</u>
<input type="checkbox"/> Subcontract	<input type="checkbox"/> As noted	<input type="checkbox"/> Other
<input type="checkbox"/> Laboratory Samples	<input checked="" type="checkbox"/> Analytical Reports	

**These are transmitted as indicated below:**

<input type="checkbox"/> Execute ___ Original(s)	<input type="checkbox"/> Review & Comment	<input type="checkbox"/> For Approval
<input type="checkbox"/> Return ___ Original(s)	<input type="checkbox"/> As Requested	<input type="checkbox"/> Respond as instructed
<input checked="" type="checkbox"/> For Your Information/File		<input type="checkbox"/> Other

**Remarks:**

Enclosed please find one (1) copy of the following mobile lab analytical reports for analysis for your review and use for the above referenced project:

270800931 270800943

Please feel free to contact me with any questions or if you require additional information

Copy to: \_\_\_\_\_ Signed: Charles LaCerra

# INTERNAL CHAIN OF CUSTODY

9/23/2008 3:03:41 PM

Order ID: 270800931

Attn: Scott Carney  
EMR, Inc.  
11 East Superior Street  
Suite 260  
Duluth, MN 55802

Fax: (218) 625-2337 Phone: (218) 625-2332

Project: Samples collected 9/23/2008

Customer ID: EMRI78

Customer PO:

Received: 09/23/08 1:45 PM

EMSL Order: 270800931

EMSL Proj ID: BNSF Libby, MT 2008

Cust COC ID

Invoice to Burlington N. Santa Fe/BNSF Rlwy (BURL54), 2500 Lou Menk Drive, Fort Worth, TX 76131

**Test:** TEM ISO 10312 **Matrix:** Air **TAT:** 120 Hour **Qty:** 2

**Acct Sts:** **Slspnsn:** epodell

**Logged:** jwyattpescador

**Date:** 9/23/08

**BillingFrequency:** With Report

**Sample** ☒ Acceptable

**Condition:** ☐ Unacceptable

Comments

- ☐ Exempt from prep charge  
☐ Exempt from lab opening fee  
☐ Exempt from layer/aliquot charges

**Prepped:** AWP **Date:** 10/10/08  
**Analyzed:** MSM **Date:** 10/28/08  
**Data Entry:** DL **Date:** 10/29/08  
**Screened:** TP **Date:** 10/30/08  
**Mailed:** DL **Date:** 10/26/09

**Special Instructions** Prehardcopy review OK 1/19/09

Order ID	Lab Sample #	Cust. Sample #	Location	Due Date
270800931	270800931-0001	39 <u>DL</u>		9/28/2008 1:45:00 PM
270800931	270800931-0002	40 <u>DL</u>		9/28/2008 1:45:00 PM

2708-EMR-49(J-L)



## Indirect Preparation Record

TEM Air    TEM Dust    TEM ISO PCM

(Circle One)

Prepped by:	Date:	Indirect without ashing			Dilution Filtration						Indirect with Ashing			OK to Prep to Grid? Y/N
		Fraction of filter used	1st Resuspend Volume mL	Volume applied to filter mL	Volume of 1st Resuspend used mL	2nd Re-suspend Volume mL	Volume applied to filter mL	Volume of 2nd Re-suspend used mL	3rd Re-suspend Volume mL	Volume applied to filter mL	Fraction of filter ashed	Volume used to resuspend residue mL	Volume applied to 2nd filter mL	
Order ID	Sample #													
270800931	39										0.5	100	10	
													15	
													25	
													50	y
	40										0.5	100	10	
													15	y
													25	
													50	
	Mb1											100	100	y
	Ab											100	100	y
	Mb2											100	100	y

Controlled Document

Confidential Business Information/Property of EMSL Analytical, INC.

001428

**BNSF 2008 Libby Site Investigation v32h**  
**TEM Asbestos Structure Count -- ISO 10312**

**SAMPLE ID**

Status Overloaded  
 EPA Sample Number 39  
 QA Type Not QA  
 Lab Sample Number 270800931-0001  
 Sample Type Air  
 Category Field  
 Prep Direct  
 Counting Rules 10312

**PARAMETERS**

Effective filter area 385.0 mm2  
 Indirect factor 1.00E+00  
 Number of Grid Openings (amphibole) 0  
 Number of Grid Openings (chrysotile) 0  
 Grid opening area 0.0130 mm2  
 Volume (L) or Area (cm2) 792 L  
 Sensitivity (amphibole) s/cc  
 Sensitivity (chrysotile) s/cc

**Recording**  
**Rules:**

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

**Stopping**  
**Rules:**

Target S	Max GOs	Max N
0.0024	39	50

**COUNTS (based on countable structures only)**

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	0	0	0		
b	0	0	0		
c	0	0	0		
d	0	0	0		
e	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK  
 Grand total 0 OK

**CONCENTRATION (s/cc)**

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	<DL	<DL	<DL		
b	<DL	<DL	<DL		
c	<DL	<DL	<DL		
d	<DL	<DL	<DL		
e	<DL	<DL	<DL		
f	<DL	<DL	<DL		
Total	<DL	<DL	<DL	<DL	<DL

Type	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	a			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	c		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	e	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

FILE NAME: 39 270800931-0001 ISO 01:00:00 D.xls

FILE TYPE: Original

## BNSF 2008 Libby Site Investigation v32h

## TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	JEOL 100 CX II (49)
Voltage (KV)	100 KV
Magnification	19,000 X
Grid opening area (mm2)	0.0130
Scale: 1L =	1.000
Scale: 1D =	1.000
Primary filter area (mm2)	385.0
Secondary Filter Area (mm2)	360.0
Category	Field
Filter Status	Overloaded

EPA Sample Number:	39
Sample Type	Air
Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	792
Date received by lab	9/23/2008
Lab Job Number:	270800931
Lab Sample Number:	270800931-0001
Number of grids prepared	
Prepared by	
Preparation date	
EPA COC Number	0931

Analyzed by	
Analysis date	
Prep	Direct
If sample type = air, is there loose material or debris in the bowl?	No
Counting rules	ISO (Air or Dust)
Grid storage location	
Archive filter(s) storage location	Westmont
F- factor	1
QA Type	Not QA

## Recording Rules:

≥ 3:1	Minimum Aspect Ratio
0.50	Minimum Length (um)
none	Minimum Width (um)

## Stopping Rules:

0.0024	Target Sensitivity
16	GOs required to reach target sensitivity
39	Maximum # of GOs
50	Maximum # of Structure
16	Estimated # of GOs

## F-factor Calculation:

## Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing  
[For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

## Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

## Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction:	V
----------------------------------	---

## COMMENTS

overloaded

39\_270800931-0001\_ISO\_01-00-00\_D.xls

39  
270800931-0001

Sample Type	Air
Count Rule	10312

Prep	Direct
QA Type	Not QA

OK - No errors found

L. Ramowski
10/29/2008

QA by:	T. Peters
QA date:	10/30/2008

[illegible]



**BNSF 2008 Libby Site Investigation v32h**  
**TEM Asbestos Structure Count -- ISO 10312**

**SAMPLE ID**

Status Analyzed  
 EPA Sample Number 39  
 QA Type Not QA  
 Lab Sample Number 270800931-0001  
 Sample Type Air  
 Category Field  
 Prep Indirect - Ashed  
 Counting Rules 10312

**PARAMETERS**

Effective filter area 360.0 mm2  
 Indirect factor 2.50E-01  
 Number of Grid Openings (amphibole) 39  
 Number of Grid Openings (chrysotile) 39  
 Grid opening area 0.0130 mm2  
 Volume (L) or Area (cm2) 792 L  
 Sensitivity (amphibole) 3.59E-03 s/cc  
 Sensitivity (chrysotile) 3.59E-03 s/cc

**Recording**  
**Rules:**

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

**Stopping**  
**Rules:**

Target S	Max GOs	Max N
0.0024	39	50

**COUNTS (based on countable structures only)**

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	0	0	0		
b	0	0	0		
c	0	0	0		
d	0	0	0		
e	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK

Grand total 0 OK

**CONCENTRATION (s/cc)**

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	<DL	<DL	<DL		
b	<DL	<DL	<DL		
c	<DL	<DL	<DL		
d	<DL	<DL	<DL		
e	<DL	<DL	<DL		
f	<DL	<DL	<DL		
Total	<DL	<DL	<DL	<DL	<DL

Type	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	a			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	c		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	e	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

FILE NAME: 39:270800931-0001 ISO 10:28-08 1A.xls

FILE TYPE: Original

## BNSF 2008 Libby Site Investigation v32h

## TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	JEOL 100 CX II (49)
Voltage (KV)	100 kV
Magnification	19,000 X
Grid opening area (mm2)	0.0130
Scale: 1L =	1.000
Scale: 1D =	1.000
Primary filter area (mm2)	385.0
Secondary Filter Area (mm2)	360.0
Category	Field
Filter Status	Analyzed

EPA Sample Number:	39
Sample Type	Air
Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	792.0
Date received by lab	9/23/2008
Lab Job Number:	270800931
Lab Sample Number:	270800931-0001
Number of grids prepared	5
Prepared by	E.Wyatt-Pescador
Preparation date	10/10/2008
EPA COC Number	0931

Analyzed by	R. Pescador
Analysis date	10/28/2008
Prep	Indirect - Ashed
if sample type = air, is there loose material or debris in the bowl?	No
Counting rules	ISO (Air or Dust)
Grid storage location	2708-EMR-49, J
Archive filter(s) storage location	Westmont
Enter the appropriate data in the cells to the right to calculate the F-factor >>>>>	
F- factor	0.25
QA Type	Not QA

## Recording Rules:

≥ 3:1	Minimum Aspect Ratio
0.50	Minimum Length (um)
none	Minimum Width (um)

## Stopping Rules:

0.0024	Target Sensitivity
59	GOs required to reach target sensitivity
39	Maximum # of GOs
50	Maximum # of Structures
39	Estimated # of GOs

## F-factor Calculation:

## Indirect Prep Inputs

0.5	Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]
100	First resuspension volume or rinsate volume (mL)
50	Volume applied to secondary filter (mL) or used for serial dilution

## Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

## Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
--	--

0.25 F-factor

Grid opening traverse direction:

V

## COMMENTS

39 270800931-0001 ISO 10-28-08 IA.xls

### ERROR CHECK

OK - No errors found

10/30/2008

[illegible]

[illegible]



**BNSF 2008 Libby Site Investigation v32h**  
**TEM Asbestos Structure Count -- ISO 10312**

**SAMPLE ID**

Status Overloaded  
 EPA Sample Number 40  
 QA Type Not QA  
 Lab Sample Number 270800931-0002  
 Sample Type Air  
 Category Field  
 Prep Direct  
 Counting Rules 10312

**PARAMETERS**

Effective filter area 385.0 mm2  
 Indirect factor 1.00E+00  
 Number of Grid Openings (amphibole) 0  
 Number of Grid Openings (chrysotile) 0  
 Grid opening area 0.0130 mm2  
 Volume (L) or Area (cm2) 918 L  
 Sensitivity (amphibole) s/cc  
 Sensitivity (chrysotile) s/cc

**Recording**  
**Rules:**

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

**Stopping**  
**Rules:**

Target S	Max GOs	Max N
0.0024	39	50

**COUNTS (based on countable structures only)**

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	0	0	0		
b	0	0	0		
c	0	0	0		
d	0	0	0		
e	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK

Grand total 0 OK

**CONCENTRATION (s/cc)**

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	<DL	<DL	<DL		
b	<DL	<DL	<DL		
c	<DL	<DL	<DL		
d	<DL	<DL	<DL		
e	<DL	<DL	<DL		
f	<DL	<DL	<DL		
Total	<DL	<DL	<DL	<DL	<DL

Type	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	a			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	c		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	e	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

FILE NAME: 40-270800931-0002 ISO-01-00-00.D.xls

FILE TYPE: Original

## BNSF 2008 Libby Site Investigation v32h

## TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	JEOL 100 CX II (49)
Voltage (KV)	100 kV
Magnification	19,000 X
Grid opening area (mm2)	0.0130
Scale: 1L =	1.000
Scale: 1D =	1.000
Primary filter area (mm2)	385.0
Secondary Filter Area (mm2)	380.0
Category	Field
Filter Status	Overloaded

EPA Sample Number:	40
Sample Type	Air
Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	918
Date received by lab	9/23/2008
Lab Job Number:	270800931
Lab Sample Number:	270800931-0002
Number of grids prepared	
Prepared by	
Preparation date	
EPA COC Number	0931

Analyzed by	
Analysis date	
Prep	Direct
If sample type = air, is there loose material or debris in the bowl?	No
Counting rules	ISO (Air or Dust)
Grid storage location	
Archive filter(s) storage location	Westmont
F- factor	1
QA Type	Not QA

## Recording Rules:

≥ 3:1	Minimum Aspect Ratio
0.50	Minimum Length (um)
none	Minimum Width (um)

## Stopping Rules:

0.0024	Target Sensitivity
14	GOs required to reach target sensitivity
39	Maximum # of GOs
50	Maximum # of Structure
14	Estimated # of GOs

## F-factor Calculation:

## Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing  
[For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

## Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

## Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction:	V
----------------------------------	---

## COMMENTS

overloaded

40\_270800931-0002\_ISO\_01-00-00\_D.xls

ERROR CHECK
OK - No errors found

QA by:	T. Peters
QA date:	10/30/2008

[illegible]

**BNSF 2008 Libby Site Investigation v32h**  
**TEM Asbestos Structure Count -- ISO 10312**

**SAMPLE ID**

Status Analyzed  
 EPA Sample Number 40  
 QA Type Not QA  
 Lab Sample Number 270800931-0002  
 Sample Type Air  
 Category Field  
 Prep Indirect - Ashed  
 Counting Rules 10312

**PARAMETERS**

Effective filter area 360.0 mm<sup>2</sup>  
 Indirect factor 7.50E-02  
 Number of Grid Openings (amphibole) 39  
 Number of Grid Openings (chrysotile) 39  
 Grid opening area 0.0130 mm<sup>2</sup>  
 Volume (L) or Area (cm<sup>2</sup>) 918 L  
 Sensitivity (amphibole) 1.03E-02 s/cc  
 Sensitivity (chrysotile) 1.03E-02 s/cc

**Recording**  
**Rules:**

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

**Stopping**  
**Rules:**

Target S	Max GOs	Max N
0.0024	39	50

**COUNTS (based on countable structures only)**

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	0	0	0		
b	0	0	0		
c	0	0	0		
d	0	0	0		
e	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK

Grand total 0 OK

**CONCENTRATION (s/cc)**

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	<DL	<DL	<DL		
b	<DL	<DL	<DL		
c	<DL	<DL	<DL		
d	<DL	<DL	<DL		
e	<DL	<DL	<DL		
f	<DL	<DL	<DL		
Total	<DL	<DL	<DL	<DL	<DL

Type	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	a			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	c		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	e	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1



FILE NAME: 40 270800931-0002 ISO 10-28-08 A.xls

FILE TYPE: Original

## BNSF 2008 Libby Site Investigation v32h

## TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	JEOL 100 CX II (49)
Voltage (KV)	100 kV
Magnification	19,000 X
Grid opening area (mm2)	0.0130
Scale: 1L =	1.000
Scale: 1D =	1.000
Primary filter area (mm2)	385.0
Secondary Filter Area (mm2)	360.0
Category	Field
Filter Status	Analyzed

EPA Sample Number:	40
Sample Type	Air
Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	918
Date received by lab	9/23/2008
Lab Job Number:	270800931
Lab Sample Number:	270800931-0002
Number of grids prepared	5
Prepared by	E. Wyatt-Pescador
Preparation date	10/10/2008
EPA COC Number	0931

Analyzed by	R. Pescador
Analysis date	10/28/2008
Prep	Indirect - Ashed
If sample type = air, is there loose material or debris in the bowl?	No
Counting rules	ISO (Air or Dust)
Grid storage location	2708-EMR-49, K
Archive filter(s) storage location	Westmont
Enter the appropriate data in the cells to the right to calculate the F-factor >>>>	
F- factor	0.075
QA Type	Not QA

## Recording Rules:

≥ 3:1	Minimum Aspect Ratio
0.50	Minimum Length (um)
none	Minimum Width (um)

## Stopping Rules:

0.0024	Target Sensitivity
168	GOs required to reach target sensitivity
39	Maximum # of GOs
50	Maximum # of Structures
39	Estimated # of GOs

## F-factor Calculation:

## Indirect Prep Inputs

0.5	Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]
100	First resuspension volume or rinsate volume (mL)
15	Volume applied to secondary filter (mL) or used for serial dilution

## Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

## Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
--	--

0.075 F-factor

Grid opening traverse direction: V

## COMMENTS

40 270800931-0002 ISO 10-28-08 |A.xls

OK - No errors found

T. Peters
10/30/2008

[illegible]

[illegible]

**BNSF 2008 Libby Site Investigation v32h**  
**TEM Asbestos Structure Count**

Laboratory name:	EMSL27
Instrument	JEOL 100 CX II (49)
Voltage (KV)	100
Magnification	19,000 X
Grid opening area (mm2)	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm2)	385
Secondary Filter Area (mm2)	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	39
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm <sup>2</sup> ), or dustfall container area (cm <sup>2</sup> )	792
Date received by lab	9/23/08
Lab Job Number:	270800931
Lab Sample Number:	270800931-0001
Number of grids prepared	
Prepared by	
Preparation date	
EPA COC Number:	
Secondary filter pore size (um)	0.2

Analyzed by	
Analysis date	
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
If sample type = air, is there loose material or debris in the cow? (Yes, No)	No
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

**F-Factor Calculation (Indirect Preps Only):**

Enter data in appropriate cells provided to the right—>

Recording Rules:

Minimum Aspect Ratio (circle one):

none       $\geq 3:1$        ~~$\geq 5:1$~~

Minimum Length ( $\mu\text{m}$ ):      0.5

Minimum Width ( $\mu\text{m}$ ):      None

<u>Stopping Rules:</u>	
Target Sensitivity:	$\frac{0.0024}{0.005}$
Max # of GOs:	$\frac{10}{39}$
Target # of Structures:	50

[illegible]

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Grid opening traverse direction (circle one):

H Horizontal  
V Vertical

Are prepped grids acceptable for analysis? (circle one)    Yes    No

If No, explain:

**BNSF 2008 Libby Site Investigation v32h**  
**TEM Asbestos Structure Count**

Laboratory name:	EMSL27
Instrument	JEOL 100 CX II (49)
Voltage (KV)	100
Magnification	19,000 X
Grid opening area (mm <sup>2</sup> )	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm <sup>2</sup> )	325
Secondary Filter Area (mm <sup>2</sup> )	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	39
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm <sup>2</sup> ), or dustfall container area (cm <sup>2</sup> )	792
Date received by lab	9/23/08
Lab Job Number:	270800931
Lab Sample Number:	270800931-0001
Number of grids prepared	5
Prepared by	E. Wyatt-Pescador
Preparation date	10/10/08
EPA COC Number:	
Secondary filter pore size (um)	0.2

Analyzed by	R. Pescador
Analysis date	10/28/2008
Method (D=Direct, i=Indirect, IA=Indirect, ashed)	IA
If sample type = air, is there loose material or debris in the cowl? (Yes, No)	No
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	2708-EMR-49, J
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right-->

<u>Recording Rules:</u>	
Minimum Aspect Ratio (circle one):	
none	≥ 3:1
Minimum Length (um):	0.5
Minimum Width (um):	None

<u>Stopping Rules:</u>	
Target Sensitivity:	0.0024
Max # of GOs:	39
Target # of Structures:	50

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Sketch/ Comments	1 = yes, blank = no			Fract. GO Chrys.
			Primary	Total	Length	Width		LA	OA	C	NAM		Sketch	Photo	EDS	
1	F1	ND														
	F3	ND														
	F5	ND														
	F7	ND														
	F9	ND														
	E2	ND														
	E4	ND														
	E6	ND														
	E8	ND														
10	E10	ND														

F-factor Calculation:

Indirect Prep Inputs

0.5	Fraction of primary filter used for indirect prep or ashing (For dust and dustfall, enter 1.0)
100	First resuspension volume or rinse volume (mL)
50	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
--	--

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Grid opening traverse direction (circle one):

H Horizontal  
 V Vertical

Are prepped grids acceptable for analysis? (circle one) Yes No

If No, explain:





[illegible]

**BNSF 2008 Libby Site Investigation v32h  
TEM Asbestos Structure Count**

Laboratory name:	EMSL27
Instrument	JEOL 100 CX II (49)
Voltage (KV)	100
Magnification	19,000 X
Grid opening area (mm <sup>2</sup> )	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm <sup>2</sup> )	385
Secondary Filter Area (mm <sup>2</sup> )	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	40
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm <sup>2</sup> ), or dustfall container area (cm <sup>2</sup> )	918
Date received by lab	9/23/08
Lab Job Number:	270800931
Lab Sample Number:	270800931-0002
Number of grids prepared	
Prepared by	
Preparation date	
EPA COC Number:	
Secondary filter pore size (um)	0.2

Analyzed by	
Analysis date	
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
If sample type = air, is there loose material or debris in the bowl? (Yes, No)	No
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

## F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right—&gt;

<b>Recording Rules:</b>	
Minimum Aspect Ratio (circle one):	none <u>≥ 3</u> <del>≥ 5</del>
Minimum Length (um):	0.5
Minimum Width (um):	None

<b>Stopping Rules:</b>	
Target Sensitivity:	<u>0.0024</u> <del>0.005</del>
Max # of GOs:	<u>10-39</u>
Target # of Structures:	50

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Sketch/ Comments	1 = yes, blank = no			Fract. GO Chrys.
			Primary	Total	Length	Width		LA	OA	C	NAM		Sketch	Photo	EDS	

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Grid opening traverse direction (circle one):

H Horizontal

V Vertical

Are prepped grids acceptable for analysis? (circle one) Yes No

If No, explain:

## F-factor Calculation:

## Indirect Prep Inputs

	Fraction of primary filter used for Indirect prep or ashing (For dust and dustfall, enter 1.0)
	First resuspension volume or rinse volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

## Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

## Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
--	--

**BNSF 2008 Libby Site Investigation v32h**  
**TEM Asbestos Structure Count**

Laboratory name:	EMSL27
Instrument	JEOL 100 CX II (49)
Voltage (KV)	100
Magnification	19,000 X
Grid opening area (mm <sup>2</sup> )	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm <sup>2</sup> )	385
Secondary Filter Area (mm <sup>2</sup> )	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	40
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm <sup>2</sup> ), or dustfall container area (cm <sup>2</sup> )	918
Date received by lab	9/23/08
Lab Job Number:	270800931
Lab Sample Number:	270800931-0002
Number of grids prepared	5
Prepared by	E. Wyatt-Pescador
Preparation date	10/10/08
EPA COC Number:	
Secondary filter pore size (um)	0.2

Analyzed by	R. Pescador
Analysis date	10/28/2008
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	IA
If sample type = air, is there loose material or debris in the bowl? (Yes, No)	No
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	2708-EMR-49, K
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right-->

<u>Recording Rules:</u>	
Minimum Aspect Ratio (circle one):	
none	≥ 3:1
Minimum Length (um):	0.5
Minimum Width (um):	None

<u>Stopping Rules:</u>	
Target Sensitivity:	0.0024
Max # of GOs:	39
Target # of Structures:	50

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Sketch/ Comments	1 = yes, blank = no			Fract. GO Chrys.
			Primary	Total	Length	Width		LA	OA	C	NAM		Sketch	Photo	EDS	
1	H6	ND														
	H8	ND														
	H10	ND														
	F3	ND														
	F5	ND														
	F7	ND														
	E4	ND														
	E6	ND														
	E8	ND														
	E10	ND														

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Grid opening traverse direction (circle one):

H Horizontal  
 V Vertical

Are prepped grids acceptable for analysts? (circle one) Yes No

If No, explain:

F-factor Calculation:

Indirect Prep Inputs

0.5	Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]
100	First resuspension volume or rinsate volume (mL)
15	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
--	--

[illegible]



[illegible]



EMSL Analytical, Inc.

Asbestos

## CHAIN OF CUSTODY

Revised January 1, 2000

ORDER ID#  
270800931

EMSL Rep:

Your Company Name:

Street:

Box #:

City/State:

EMSL Analytical, Inc.

107 4<sup>th</sup> Street West

Libby, MT

Zip:

59923

Bill to:

Street:

City/State:

Emr, Inc

Scott Carna

Duluth, MN

Zip:

Phone Results to: Name:

Telephone #:

Project Name/Number:

Scott Carna

Fax Results to: Name:

Fax #:

Purchase Order #:

## MATRIX

## TURNAROUND

<input checked="" type="checkbox"/> Air	<input type="checkbox"/> Soil	<input type="checkbox"/> Micro-Vac	<input type="checkbox"/> 3 hrs	<input type="checkbox"/> 6 Hours	<input type="checkbox"/> Same Day or 12 Hours*	<input type="checkbox"/> 24 Hours (1 day)
<input type="checkbox"/> Bulk	<input type="checkbox"/> Drinking Water		<input type="checkbox"/> 48 Hours (2 days)	<input type="checkbox"/> 72 Hours (3 days)	<input type="checkbox"/> 96 Hours (4 days)	<input checked="" type="checkbox"/> 120 Hours (5 Days)
<input type="checkbox"/> Wipe	<input type="checkbox"/> Wastewater		<input type="checkbox"/> 144+ hours (6-10 Days)			

TEM AIR, 3 hours, 6 hours, Please call ahead to schedule. There is a premium charge for 3-hour tat; please call 1-800-220-3675 for price prior to sending samples. You will be asked to sign an authorization form for this service.

\*12 hours (must arrive by 11:00 a.m Mon - Fri.), Please Refer to Price Quote

<b>PCM - Air</b> <input type="checkbox"/> NIOSH 7400(A) Issue 2: August 1994 <input type="checkbox"/> OSHA w/ TWA <input type="checkbox"/> Other: <b>PLM - Bulk</b> <input type="checkbox"/> EPA 600/R-93/116 <input type="checkbox"/> EPA Point Count <input type="checkbox"/> NYS Stratified Point Count <input type="checkbox"/> PLM NOB (Gravimetric) NYS 198.1 <input type="checkbox"/> NIOSH 9002 <input type="checkbox"/> EMSL Standard Addition <b>SEM Air or Bulk</b> <input type="checkbox"/> Qualitative <input type="checkbox"/> Quantitative	<b>TEM Air</b> <input type="checkbox"/> AHERA 40 CFR, Part 763 Subpart E <input type="checkbox"/> NIOSH 7402 Issue 2 <input type="checkbox"/> EPA Level II <input checked="" type="checkbox"/> Iso <b>TEM Bulk</b> <input type="checkbox"/> Drop Mount (Qualitative) <input type="checkbox"/> Chatfield SOP - 1988-02 <input type="checkbox"/> TEM NOB (Gravimetric) NYS 198.4 <input type="checkbox"/> EMSL Standard Addition <b>PLM Soil</b> <input type="checkbox"/> EPA Protocol Qualitative <input type="checkbox"/> EPA Protocol Quantitative <input type="checkbox"/> EMSL MSD 9000 Method fibers/gram	<b>TEM Water</b> <input type="checkbox"/> EPA 100.1 <input type="checkbox"/> EPA 100.2 <input type="checkbox"/> NYS 198.2 <b>TEM Microvac/Wipe</b> <input type="checkbox"/> ASTM D 5755-95 quantitative <input type="checkbox"/> Wipe Qualitative <b>XRD</b> <input type="checkbox"/> Asbestos <input type="checkbox"/> Silica NIOSH 7500 <b>OTHER</b> <input type="checkbox"/>
--	--	--

Client Sample # (s)

Relinquished:

Received:

Total Samples #:

Date:

Date:

Time:

Time:

Relinquished: Steve J. Wyatt - Pescador DATE: 12/14/08 TIME: 1558  
Received L. Garmowski EMSL Date 12/19/08 9:06.



EMSL Analytical, Inc.

Asbestos

ORDER ID#

270800931

**CHAIN OF CUSTODY**

Revised January 1, 2000

SAMPLE NUMBER	SAMPLE DESCRIPTION/LOCATION			VOLUME (If Applicable)
39	9/23/08	OCHA	mule/marker 1577	752
40	9/23/08	✓	<del>1577</del>	918

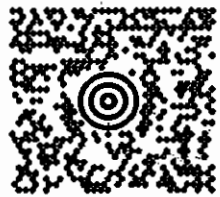
JOMAY WYATT-PESCADOR  
406-293-9066  
EMSL ANALYTICAL, INC.  
107 WEST 4TH STREET  
LIBBY MT 59923

25 LBS

1 OF 1

**SHIP TO:**

CHARLES LACERRA  
856-858-4800 1253  
EMSL ANALYTICAL, INC.  
107 HADDON AVENUE  
WESTMONT NJ 08108-2711

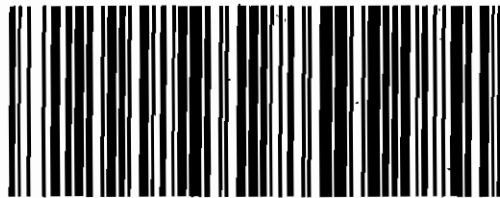


**NJ 081 9-06**



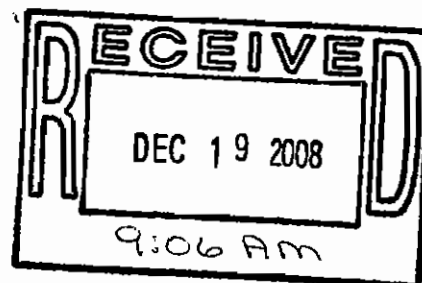
**UPS GROUND**

TRACKING #: 1Z Y84 048 03 9398 9125



BILLING: P/P

UPS 10.6.07. WXP1270 84.0A 10/2008



# INTERNAL CHAIN OF CUSTODY

9/25/2008 2:42:03 PM

Order ID: 270800943

Attn: Scott Carney  
EMR, Inc.  
11 East Superior Street  
Suite 260  
Duluth, MN 55802

Fax: (218) 625-2337 Phone: (218) 625-2332

Project: Samples collected 9/24/2008

Customer ID: EMRI78

Customer PO:

Received: 09/25/08 1:21 PM

EMSL Order: 270800943

EMSL Proj ID: BNSF Libby, MT 2008

Cust COC ID

Invoice to Burlington N. Santa Fe/BNSF Rlwy (BURL54), 2500 Lou Menk Drive, Fort Worth, TX 76131

**Test:** TEM ISO 10312 **Matrix** Air **TAT:** 120 Hour **Qty:** 2

**Acct Sts:** **Slspnsn:** epodell

**Logged:** jwyattpescador

**Date:** 9/25/08

**BillingFrequency:** With Report

**Sample** ☒ Acceptable

**Condition:** ☐ Unacceptable

Comments

- ☐ Exempt from prep charge  
☐ Exempt from lab opening fee  
☐ Exempt from layer/aliquot charges

**Prepped:** LSM **Date:** 10/10/08  
**Analyzed:** PTD **Date:** 10/28/08  
**Data Entry:** du **Date:** 10/29/08  
**Screened:** TP **Date:** 10/30/08  
**Mailed:** du **Date:** 1/26/09

**Special Instructions** Prehard copy review CK 1/19/09

Order ID	Lab Sample #	Cust. Sample #	Location	Due Date
270800943	270800943-0001	47		9/30/2008 1:21:00 PM
270800943	270800943-0002	48		9/30/2008 1:21:00 PM

2708-EMR-49(H-I)



[illegible]

**BNSF 2008 Libby Site Investigation v32h**  
**TEM Asbestos Structure Count -- ISO 10312**

**SAMPLE ID**

Status Overloaded  
EPA Sample Number 47  
QA Type Not QA  
Lab Sample Number 270800943-0001  
Sample Type Air  
Category Field  
Prep Direct  
Counting Rules 10312

**PARAMETERS**

Effective filter area 385.0 mm2  
Indirect factor 1.00E+00  
Number of Grid Openings (amphibole) 0  
Number of Grid Openings (chrysotile) 0  
Grid opening area 0.0130 mm2  
Volume (L) or Area (cm2) 964 L  
Sensitivity (amphibole) s/cc  
Sensitivity (chrysotile) s/cc

**Recording Rules:**

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

**Stopping Rules:**

Target S	Max GOs	Max N
0.0024	39	50

**COUNTS (based on countable structures only)**

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	0	0	0		
b	0	0	0		
c	0	0	0		
d	0	0	0		
e	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK  
Grand total 0 OK

**CONCENTRATION (s/cc)**

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	<DL	<DL	<DL		
b	<DL	<DL	<DL		
c	<DL	<DL	<DL		
d	<DL	<DL	<DL		
e	<DL	<DL	<DL		
f	<DL	<DL	<DL		
Total	<DL	<DL	<DL	<DL	<DL

Type	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	a			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	c		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	e	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

FILE NAME: 47-270800943-0001 ISO 101:00:00 D.xls

FILE TYPE: Original

## BNSF 2008 Libby Site Investigation v32h

## TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	JEOL 100 CX II (49)
Voltage (KV)	100 kV
Magnification	19,000 X
Grid opening area (mm2)	0.0130
Scale: 1L =	1.000
Scale: 1D =	1.000
Primary filter area (mm2)	385.0
Secondary Filter Area (mm2)	360.0
Category	Field
Filter Status	Overloaded

EPA Sample Number:	47
Sample Type	Air
Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	964.0
Date received by lab	9/25/2008
Lab Job Number:	270800943
Lab Sample Number:	270800943-0001
Number of grids prepared	
Prepared by	
Preparation date	
EPA COC Number	0943

Analyzed by	
Analysis date	
Prep	Direct
If sample type = air, is there loose material or debris in the bowl?	No
Counting rules	ISO (Air or Dust)
Grid storage location	
Archive filter(s) storage location	Westmont
F- factor	1
QA Type	Not QA

## COMMENTS

overloaded

## Recording Rules:

≥ 3:1	Minimum Aspect Ratio
0.50	Minimum Length (um)
none	Minimum Width (um)

## Stopping Rules:

0.0024	Target Sensitivity -
13	GOs required to reach target sensitivity
39	Maximum # of GOs
50	Maximum # of Structure
13	Estimated # of GOs

## F-factor Calculation:

## Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing  
[For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

## Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

## Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction:	V
----------------------------------	---

47\_270800943-0001\_ISO\_01-00-00\_D.xls

47

270800943-0001

## Air

10312

Direct

Not QA

OK - No errors found

L. Ramowski

10/29/2008

T. Peters

10/30/2008

[illegible]

**BNSF 2008 Libby Site Investigation v32h**  
**TEM Asbestos Structure Count -- ISO 10312**

**SAMPLE ID**

Status Analyzed  
 EPA Sample Number 47  
 QA Type Not QA  
 Lab Sample Number 270800943-0001  
 Sample Type Air  
 Category Field  
 Prep Indirect - Ashed  
 Counting Rules 10312

**PARAMETERS**

Effective filter area 360.0 mm2  
 Indirect factor 1.25E-01  
 Number of Grid Openings (amphibole) 39  
 Number of Grid Openings (chrysotile) 39  
 Grid opening area 0.0130 mm2  
 Volume (L) or Area (cm2) 964 L  
 Sensitivity (amphibole) 5.89E-03 s/cc  
 Sensitivity (chrysotile) 5.89E-03 s/cc

**Recording**  
**Rules:**

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

**Stopping**  
**Rules:**

Target S	Max GOs	Max N
0.0024	39	50

**COUNTS (based on countable structures only)**

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	0	0	0		
b	0	0	0		
c	0	0	0		
d	0	0	0		
e	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK  
 Grand total 0 OK

**CONCENTRATION (s/cc)**

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	<DL	<DL	<DL		
b	<DL	<DL	<DL		
c	<DL	<DL	<DL		
d	<DL	<DL	<DL		
e	<DL	<DL	<DL		
f	<DL	<DL	<DL		
Total	<DL	<DL	<DL	<DL	<DL

Type	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	a			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	c		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	e	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1



FILE NAME: 47 270800943-0001 ISO 10-28-08 IA.xls

FILE TYPE: Original

## BNSF 2008 Libby Site Investigation v32h

## TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	JEOL 100 CX II (49)
Voltage (KV)	100 kV
Magnification	19,000 X
Grid opening area (mm2)	0.0130
Scale: 1L =	1.000
Scale: 1D =	1.000
Primary filter area (mm2)	385.0
Secondary Filter Area (mm2)	360.0
Category	Field
Filter Status	Analyzed

EPA Sample Number:	47
Sample Type	Air
Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	964.0
Date received by lab	9/25/2008
Lab Job Number:	270800943
Lab Sample Number:	270800943-0001
Number of grids prepared	3
Prepared by	E.Wyatt-Pescador
Preparation date	10/10/2008
EPA COC Number	0943

Analyzed by	R. Pescador
Analysis date	10/28/2008
Prep	Indirect - Ashed
If sample type = air, is there loose material or debris in the bowl?	No
Counting rules	ISO (Air or Dust)
Grid storage location	2708-EMR-49, H
Archive filter(s) storage location	Westmont
Enter the appropriate data in the cells to the right to calculate the F-factor >>>>>	
F- factor	0.125
QA Type	Not QA

## Recording Rules:

≥ 3:1	Minimum Aspect Ratio
0.50	Minimum Length (um)
none	Minimum Width (um)

## Stopping Rules:

0.0024	Target Sensitivity -
96	GOs required to reach target sensitivity
39	Maximum # of GOs
50	Maximum # of Structure
39	Estimated # of GOs

## F-factor Calculation:

## Indirect Prep Inputs

0.5	Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]
100	First resuspension volume or rinsate volume (mL)
25	Volume applied to secondary filter (mL) or used for serial dilution

## Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

## Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
--	--

0.125 F-factor

Grid opening traverse direction:	V
----------------------------------	---

## COMMENTS

## 47 270800943-0001 ISO 10-28-08 IA.xls

ERROR CHECK
OK - No errors found

QA by:	T. Peters
QA date:	10/30/2008

[illegible]



**BNSF 2008 Libby Site Investigation v32h**  
**TEM Asbestos Structure Count -- ISO 10312**

Version

SM

**SAMPLE ID**

Status Analyzed  
 EPA Sample Number 48  
 QA Type Not QA  
 Lab Sample Number 270800943-0002  
 Sample Type Air  
 Category Field  
 Prep Direct  
 Counting Rules 10312

**PARAMETERS**

Effective filter area 385.0 mm<sup>2</sup>  
 Indirect factor 1.00E+00  
 Number of Grid Openings (amphibole) 13  
 Number of Grid Openings (chrysotile) 13  
 Grid opening area 0.0130 mm<sup>2</sup>  
 Volume (L) or Area (cm<sup>2</sup>) 967 L  
 Sensitivity (amphibole) 2.36E-03 s/cc  
 Sensitivity (chrysotile) 2.36E-03 s/cc

**Recording**  
**Rules:**

Min. AR	Min length (um)	Min width (um)
≥ 3:1	0.5	none

**Stopping**  
**Rules:**

Target S	Max GOs	Max N
0.0024	13	50

**COUNTS (based on countable structures only)**

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	0	0	0		
b	0	0	0		
c	0	0	0		
d	0	0	0		
e	0	0	0		
f	0	0	0		
Total	0	0	0	0	0

Check OK OK OK

Grand total 0 OK

**CONCENTRATION (s/cc)**

Bin	LA	OA	C	PCME(all)	PCME(asb)
a	<DL	<DL	<DL		
b	<DL	<DL	<DL		
c	<DL	<DL	<DL		
d	<DL	<DL	<DL		
e	<DL	<DL	<DL		
f	<DL	<DL	<DL		
Total	<DL	<DL	<DL	<DL	<DL

Type	Bin	Length	Width	Aspect ratio
LA = Libby-type amphibole	a			<5
OA = Other amphibole	b	<.5		>= 5
C = Chrysotile	c		>.5	>= 5
	d	>=.5 to < 5	<=.5	>= 5
	e	5 to 10	<=.5	>= 5
	f	>10	<=.5	>= 5

PCME: Length &gt; 5 um, Width &gt;= 0.25 um, Aspect Ratio &gt;= 3:1

FILE NAME: 48 270800943-0002 ISO 10-28-08 D.xls

FILE TYPE: Original

## BNSF 2008 Libby Site Investigation v32h

## TEM Asbestos Structure Count

Laboratory name:	EMSL27
Instrument	JEOL 100 CX II (49)
Voltage (KV)	100 kV
Magnification	19,000 X
Grid opening area (mm2)	0.0130
Scale: 1L =	1.000
Scale: 1D =	1.000
Primary filter area (mm2)	385.0
Secondary Filter Area (mm2)	360.0
Category	Field
Filter Status	Analyzed

EPA Sample Number:	48
Sample Type	Air
Air volume (L), dust sample area (cm2), or dustfall container area (cm2)	967.0
Date received by lab	9/25/2008
Lab Job Number:	270800943
Lab Sample Number:	270800943-0002
Number of grids prepared	3
Prepared by	E.Wyatt-Pescador
Preparation date	10/10/2008
EPA COC Number	0943

Analyzed by	R. Pescador
Analysis date	10/28/2008
Prep	Direct
If sample type - air, is there loose material or debris in the bowl?	No
Counting rules	ISO (Air or Dust)
Grid storage location	2708-EMR-49, H
Archive filter(s) storage location	Westmont
F- factor	1
QA Type	Not QA

## Recording Rules:

≥ 3:1	Minimum Aspect Ratio
0.50	Minimum Length (um)
none	Minimum Width (um)

## Stopping Rules:

0.0024	Target Sensitivity
13	GOs required to reach target sensitivity
13	Maximum # of GOs
50	Maximum # of Structure
13	Estimated # of GOs

## F-factor Calculation:

## Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing  
[For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

## Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

## Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction:

V

## COMMENTS

48 270800943-0002 ISO 10-28-08 D.xls

ERROR CHECK
OK - No errors found

QA by:	T. Peters
QA date:	10/30/2008

[illegible]



**BNSF 2008 Libby Site Investigation v32h**  
**TEM Asbestos Structure Count**

Laboratory name:	EMSL27
Instrument	JEOL 100 CX II (49)
Voltage (KV)	100
Magnification	19,000 X
Grid opening area (mm2)	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm2)	38
Secondary Filter Area (mm2)	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	47
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm <sup>2</sup> ), or dustfall container area (cm <sup>2</sup> )	964
Date received by lab	9/25/08
Lab Job Number:	270800943
Lab Sample Number:	270800943-0001
Number of grids prepared	
Prepared by	
Preparation date	
EPA COC Number:	
Secondary filter pore size (um)	0.2

Analyzed by	
Analysis date	
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
If sample type = air, is there loose material or debris in the cow? (Yes, No)	No
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

**F-Factor Calculation (Indirect Preps Only):**

Enter data in appropriate cells provided to the right—>

Recording Rules:

Minimum Aspect Ratio (circle one):

none       $\geq 3:1$        ~~$\geq 5:1$~~

Minimum Length ( $\mu\text{m}$ ):      0.5

Minimum Width ( $\mu\text{m}$ ):      None

Stopping Rules:

Target Sensitivity:  $\frac{0.0024}{0.005}$

Max # of GOs:  $39 - 18$

Target # of Structures: 50

**F-factor Calculation:**

Indirect Prep Inputs	
	Fraction of primary filter used for indirect prep or ashing <i>[For dust and dustfall, enter 1.0]</i>
	First resuspension volume or rinse volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

### Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

1	2	3	4	5	6	7	8	9	10	11

[illegible]

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Grid opening traverse direction (circle one):

H Horizontal

V Vertical

Are prepped grids acceptable for analysis? (circle one)    Yes    No

If No, explain:

**BNSF 2008 Libby Site Investigation v32h  
TEM Asbestos Structure Count**

Page 1 of 3

Laboratory name:	EMSL27
Instrument	JEOL 100 CX II (49)
Voltage (KV)	100
Magnification	19,000 X
Grid opening area (mm <sup>2</sup> )	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm <sup>2</sup> )	385
Secondary Filter Area (mm <sup>2</sup> )	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	47
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm <sup>2</sup> ), or dustfall container area (cm <sup>2</sup> )	964
Date received by lab	9/25/08
Lab Job Number:	270800943
Lab Sample Number:	2870800943-0001
Number of grids prepared	3
Prepared by	E. Wyatt-Pescador
Preparation date	10/10/08
EPA COC Number:	
Secondary filter pore size (um)	0.2

Analyzed by	R. Pescador
Analysis date	10/28/2008
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	IA
If sample type = air, is there loose material or debris in the bowl? (Yes, No)	No
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	2708-EMR-49, H
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

<b>Recording Rules:</b>	
Minimum Aspect Ratio (circle one):	none <u>(≥ 3:1)</u> ≥ 5:1
Minimum Length (um):	0.5
Minimum Width (um):	None

<b>Stopping Rules:</b>	
Target Sensitivity:	0.0024
Max # of GOs:	39
Target # of Structures:	50

**E-Factor Calculation (Indirect Preps Only):**

Enter data in appropriate cells provided to the right---->

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Sketch/ Comments	1 = yes, blank = no			Fract. GO Chrys.
			Primary	Total	Length	Width		LA	OA	C	NAM		Sketch	Photo	EDS	
1	J2	ND														
	J4	ND														
	J6	ND														
	J8	ND														
	I1	ND														
	I3	ND														
	I5	ND														
	I7	ND														
	I9	ND														
↓	H2	NO														

**E-factor Calculation:**

<b>Indirect Prep Inputs</b>	
<u>0.5</u>	Fraction of primary filter used for indirect prep or ashing (For dust and dustfall, enter 1.0)
<u>100</u>	First resuspension volume or rinse volume (mL)
<u>25</u>	Volume applied to secondary filter (mL) or used for serial dilution

**Inputs for Serial Dilutions**

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

**Input for Ashing of Secondary Filter**

	Fraction of secondary filter used for ashing
--	--

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Grid opening traverse direction (circle one):

H Horizontal

V Vertical

Are prepped grids acceptable for analysis? (circle one) Yes No

If No, explain:

2708-EMR-49, H

[illegible]

2708-EMR-49, H

[illegible]

**BNSF 2008 Libby Site Investigation v32h  
TEM Asbestos Structure Count**

Page 1 of 2

Laboratory name:	EMSL27
Instrument	JEOL 100 CX II (49)
Voltage (KV)	100
Magnification	19,000 X
Grid opening area (mm <sup>2</sup> )	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm <sup>2</sup> )	385
Secondary Filter Area (mm <sup>2</sup> )	360
Category (Field, Rep., Dup., Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	48
Sample Type (A=Air, D=Dust, DF = Dustfall):	A
Air volume (L), dust area (cm <sup>2</sup> ), or dustfall container area (cm <sup>2</sup> )	967
Date received by lab	9/25/08
Lab Job Number:	270800943
Lab Sample Number:	2870800943-0002
Number of grids prepared	3
Prepared by	E. Wyatt-Pescador
Preparation date	10/10/08
EPA COC Number:	
Secondary filter pore size (um)	0.2

Analyzed by	R. Pescador
Analysis date	10/28/2008
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
If sample type = air, is there loose material or debris in the cow? (Yes, No)	No
Counting rules (ISO, AHERA, ASTM)	ISO
Grid storage location	2708-EMR-49, H
Archive filter(s) storage location	Westmont
QA Type (Not QA, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QA

<b>Recording Rules:</b>	
Minimum Aspect Ratio (circle one):	none <u>≥ 3:1</u> ≥ 5:1
Minimum Length (um):	0.5
Minimum Width (um):	None

<b>Stopping Rules:</b>	
Target Sensitivity:	0.0024
Max # of GOs:	13
Target # of Structures:	50

**F-Factor Calculation (Indirect Preps Only):**

Enter data in appropriate cells provided to the right—>

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Sketch/ Comments	1 = yes, blank = no			Fract. GO Chrys.
			Primary	Total	Length	Width		LA	OA	C	NAM		Sketch	Photo	EDS	
1	F10	ND														
	F8	ND														
	F6	ND														
	F4	NP														
↓	F2	NO														
2	D10	ND														
	D8	ND														
	D6	ND														
	D4	ND														
↓	D2	NO														

**F-factor Calculation:**

**Indirect Prep inputs**

	Fraction of primary filter used for indirect prep or ashing (For dust and dustfall, enter 1.0)
	First resuspension volume or rinse volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

**Inputs for Serial Dilutions**

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

**Input for Ashing of Secondary Filter**

	Fraction of secondary filter used for ashing
--	--

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

**Grid opening traverse direction (circle one):**

H Horizontal  
V Vertical

**Are prepped grids acceptable for analysis? (circle one) Yes No**

If No, explain:

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2708-EMR-49, H

~~end of story~~



EMSL Analytical, Inc.

Asbestos

## CHAIN OF CUSTODY

Revised January 1, 2000

ORDER ID#  
27080943

EMSL Rep:

Your Company Name:

Street:

Box #:

City/State:

EMSL Analytical, Inc.

107 4<sup>th</sup> Street West

Libby, MT

Zip: 59923

Bill to:

Street:

City/State:

EMSL, Inc.  
Scott Carney

Duluth, MN Zip:

Phone Results to: Name:

Telephone #:

Project Name/Number:

Fax Results to: Name:

Fax #:

Purchase Order #:

## MATRIX

## TURNAROUND

<input checked="" type="checkbox"/> Air	<input type="checkbox"/> Soil	<input type="checkbox"/> Micro-Vac	<input type="checkbox"/> 3 hrs	<input type="checkbox"/> 6 Hours	<input type="checkbox"/> Same Day or 12 Hours*	<input type="checkbox"/> 24 Hours (1 day)
<input type="checkbox"/> Bulk	<input type="checkbox"/> Drinking Water		<input type="checkbox"/> 48 Hours (2 days)	<input type="checkbox"/> 72 Hours (3 days)	<input type="checkbox"/> 96 Hours (4 days)	<input checked="" type="checkbox"/> 120 Hours (5 Days)
<input type="checkbox"/> Wipe	<input type="checkbox"/> Wastewater		<input type="checkbox"/> 144+ hours (6-10 Days)			

TEM AIR, 3 hours, 6 hours, Please call ahead to schedule. There is a premium charge for 3-hour tat; please call 1-800-220-3675 for price prior to sending samples. You will be asked to sign an authorization form for this service.

\*12 hours (must arrive by 11:00 a.m. Mon - Fri.), Please Refer to Price Quote

## PCM - Air

- ☐ NIOSH 7400(A) Issue 2: August 1994  
☐ OSHA w/ TWA  
☐ Other:

## PLM - Bulk

- ☐ EPA 600/R-93/116  
☐ EPA Point Count  
☐ NYS Stratified Point Count  
☐ PLM NOB (Gravimetric) NYS 198.1  
☐ NIOSH 9002

☐ EMSL Standard Addition

## SEM Air or Bulk

- ☐ Qualitative  
☐ Quantitative

## TEM Air

- ☐ AHERA 40 CFR, Part 763 Subpart E  
☐ NIOSH 7402 Issue 2  
☐ EPA Level II

## TEM Bulk

- ☐ Drop Mount (Qualitative)  
☐ Chatfield SOP - 1988-02  
☐ TEM NOB (Gravimetric) NYS 198.4  
☐ EMSL Standard Addition

## PLM Soil

- ☐ EPA Protocol Qualitative  
☐ EPA Protocol Quantitative  
☐ EMSL MSD 9000 Method fibers/gram

## TEM Water

- ☐ EPA 100.1  
☐ EPA 100.2  
☐ NYS 198.2

## TEM Microvac/Wipe

- ☐ ASTM D 5755-95 quantitative  
☐ Wipe Qualitative

## XRD

- ☐ Asbestos  
☐ Silica NIOSH 7500

## OTHER

☐

Client Sample # (s)

Total Samples #:

Relinquished:

Date:

Time:

Received:

Date:

Time:

Relinquished: Elphinst J. Nyatt-Prescador / EMSL DATE: 12/4/08 TIME: 1558  
 Received: S. Gamowack EMSL DATE: 12/19/08 Time 9:06

## CHAIN OF CUSTODY

Revised January 1, 2000

[illegible]

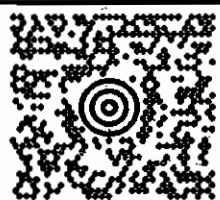
JOMAY WYATT-PESCADOR  
406-293-9066  
EMSL ANALYTICAL, INC.  
107 WEST 4TH STREET  
LIBBY MT 59923

25 LBS

1 OF 1

**SHIP TO:**

CHARLES LACERRA  
856-858-4800 1253  
EMSL ANALYTICAL, INC.  
107 HADDON AVENUE  
**WESTMONT NJ 08108-2711**



**NJ 081 9-06**



**UPS GROUND**

TRACKING #: 1Z Y84 048 03 9398 9125



BILLING: P/P

UPS 10.6.07. W001E70 84.0A 10/2008



TM

